COAL AGE

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In the Dim and Distant Future

A partial "Who's Who" sketch as it may be written in 1950

Mr. Think Um first attracted national attention by a remark that he made to a representative of the Miners' Union who had come to deliver an ultimatum—"When you fellows learn that the way to eliminate the pernicious influence of the unlawful, unprincipled element in your organization is to abolish all secret meetings and let it be known that you will conduct your business in the open, then I shall be willing to bargain with you collectively. You are the victims of your own intrigue, and intrigue cannot thrive in the open."

MR. THINK UM *first attracted national attention by a remark that he made to a representative of the Miners' Union who had come to deliver an ultimatum.*

The remark traveled across the continent like wildfire and was taken up by trade papers and union organs everywhere. As a direct result of the agitation that followed, new leaders came to the fore in most of the labor organizations and unionism really became a power in the land.

His next bid for fame also came as the result of a chance remark, but this time the remark was delivered to a body of operators instead of representatives of labor. The operators in meeting assembled were discussing the advisability of passing a motion warning the mine owners of neighboring states to cease their unholy practices or look for retaliation in kind. From time immemorial this same question had bobbed up at every annual meeting of the operators' association, and each time had been tabled after heated discussions and terrible threats.

In the midst of the argument someone unexpectedly called upon Mr. Think Um for an expression of opinion. He responded instantly: "Gentlemen, you are all very willing to make terrible intimations about 'operators,' but I question if there is a single man in the room who would be willing to get up before this body of men and repeat the things just said, word for word, until he comes to the word operator and then substitute for operators in general the name of any individual operator who belongs to the association under fire."

Dozens of men sprang to their feet instantly, but somehow before they could get hold of the right word, thought better of the adventure and sat down without so much as moving their lips. Any scatterbrain can damn a community or a state or a nation and receive applause, but one must have evidence to substantiate charges against an individual.

Unconsciously the final blow had been delivered to the myth that had kept operators' associations at dagger points for nearly a century, and from that day to this they have always worked in perfect harmony.

THESE THINGS *happened years ago, but Mr. Think Um is still idolized by both the workers and the employers. Small wonder that he has been retained as Secretary of Labor through three administrations.*

Coal-Mine Warehouse Systems--II

By E. I. Roberts*

SYNOPSIS—The second and concluding article on this subject. Requisition and record forms are given, embodying the information that the warehouse keeper must have.

The method of accounting for supplies and the manner in which their proper distribution is shown are highly important. The first consideration is the method of ordering material by the foremen. No person of lower rank than foreman should have the authority to order supplies, and not so much as a screw should be issued from the warehouse without a requisition being given for it.

A convenient form of requisition should show the date, the quantity of material desired, the nature of such material, where it is to be used, a definite number so as to avoid duplication of the order, and the foreman's signature.

A form complying with these requirements is shown in Fig. 2. It should be printed on paper of such a size that a book containing 100 blanks and duplicates can be readily carried in the pocket. The original is printed as shown, but it is only necessary to print the duplicate with the number that should coincide with that of the original. Carbon is placed on the back of the original so that a definite copy is made. This also avoids carrying a separate piece of copying paper, which is often lost by the foreman. The requisition forms and duplicates may be conveniently bound in a stiff-covered book with a linen hinge, 200 pages being bound so that 100 blanks alternate with 100 originals.

The originals may be printed in various colors, a certain shade representing a requisition from underground, while another shade would indicate one from the surface, etc. This enables the warehouse clerk to easily place on separate stick files the orders from different departments of the mine. One color, however, must be bound in one

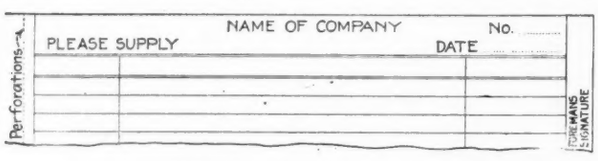


FIG. 2. CONVENIENT FORM OF REQUISITION

book. This refinement is somewhat superfluous if all requisition forms are numbered entirely different, thus avoiding any possibility of duplication. In this case all orders are distinguished one from the other by their key numbers.

Necessary Information

The foremen, on ordering material, are required to show the quantity, the nature of the material desired and the disbursement. The last is easily given at mines where each class of work is under a certain number. For example, No. 23 might stand for machine repairs, No. 30 for haulage, etc. But where no such method of distribution is in use, it is necessary that the foreman give his distribution in writing, so that when the warehouse clerk makes up his monthly statement to the head office, he can easily show the cost of supplies to any particular department. The width of the column under the heading "Distribution" or "Charged To" will therefore depend upon the foregoing requirements.

Some definite method should be arranged for the issuing of all supplies that are used in the current operation of the mine and a certain time appointed for all orders

DATE	Requisition No.	Quantity Issued	BALANCE

FIG. 3. A SUITABLE BIN RECORD

to be in, so that material can be arranged for issuance complying with the orders. A good time for this is at night. Then the clerk can arrange all supplies for entering the mine either during the night shift or before the shift starts in the morning.

Without such an arrangement it is necesary for the clerk to spend his entire time in the wareroom for the issuing of supplies. He is then unable to give due attention to materials being unloaded in the yard or to the proper classification of his stock. An instance is known where most of the clerk's time was taken up with issuing bolts, car bumpers, etc. to the car repair men and blacksmiths, who came for six or a dozen bolts as they required them, whereas the proper way would have required a daily inspection being made of the cars to be repaired and an amount of supplies being issued to cover this portion of the daily work at one time. This would have prevented the loss of time that occurs when a man is continually walking back and forth, to and from the warehouse, instead of doing his work on the cars. The warehouse keeper was also prevented by this method from giving proper attention to his own work.

A requisition for all such supplies should be issued daily, rather than a separate order being given for every particular article. This avoids red tape and unnecessary work for both foreman and supply clerk.

Requisitions Should Be Filed

After an order has been filled by the warehouse, it is important that the requisition be kept on file until the information on it is properly booked or indexed. Further than this, some sort of simple check must be kept on the material or supply issued. For instance, in the case of the issuing of certain bolts or pipe fittings some tally must be kept at the bin of the number that has been issued, and also some record to show what balance is left.

The form shown in Fig. 3 is suitable for this purpose. In the second column is placed the requisition number corresponding with the number of the order received from the foreman. In the third is placed the quantity issued, while the fourth shows the balance left in the bin, which

*Johnston City, Ill.

is simply a matter of subtraction. The first column gives the date. This form is printed on heavy cardboard suitable for nailing to the bin.

Every time an order is filled from this bin, the record is filled out according to the requisition or to what has been issued. A check is then kept on the balance in the bin, which aids the clerk when making an inventory. Form 3 is only suitable, however, where materials are stored in quantity or in bulk, such as cement, props, etc., and is used principally for the checking of material stored in bins and in sheds.

For materials not covered by this method a card-index system is used alone, although in addition to this a complete record must be kept in the card index of all material, whether Form 3 is used or not.

STORE ROOM RECORD — NAME OF COMPANY.

UNIT OF MEASURE — ARTICLE

ORDERED		RECEIVED				BALANCE	DISBURSED				
DATE	REQ. NO.	DATE	FROM	PRICE	QUANTITY	ON HAND	QUANTITY	DISTRIBUTION	REQ. NO.	DATE	DISTRIBUTION PRICE

FIG. 4. CARD SHOWING HISTORY OF MATERIAL

A Complete History

A convenient card is shown in Fig. 4. This gives a complete history of any supply from the time it is ordered from the dealer until it is issued to the mine for use. The card is printed similarly on both sides and is kept in a suitable metallic case to prevent dust and dirt spoiling the card and the record. Larger cards with tab and letter are inserted to enable the record cards to be kept alphabetically, and all cards are filed under the article named.

This and the card shown in Fig. 3 should be of the same size so that articles which are ordered often can be recorded on Form 3 and then filed behind Form 4 covering the article. This is done to avoid excessive clerical work, as it will easily be seen that Form 4 would become filled up quickly and would only mean a duplicating of Form 3 record with the attendant refilling of Form 4. Form 4 then can still remain the same complete history of any particular article; the only difference is that Form 3 is referred to instead of filling out the distribution detailed on card 4.

The first portion of Form 4 card is the requisition number of the order sent to the dealer and the date, second when received and from whom, third the price, fourth the quantity, fifth the distribution of the article, sixth the distribution price to the mine, which may be the cost to the warehouse plus 5 per cent. to cover handling, and last the balance on hand at the time when the card is made up or when the supply was last issued.

These cards should not necessarily be filled out daily as a sufficient track of supplies is kept if they are recorded weekly, with the exception that when invoices arrive and materials are checked therefrom into the warehouse, the cards should be filled out at once.

When the weekly copy of the foreman's requisition is made into the card index, a weekly copy of such orders should be made out for the head office, so that the management may have a complete record of the quantity of materials issued throughout the week, who ordered them and where such supplies are used. Form 5 is given with this in mind, and this and the card index can be filled out on Saturday afternoon, any supplies being issued on such afternoon being charged to the following week's operation.

With this system it is not necessary to keep copies of invoices on hand at the warehouse, and the only other records that are necessary are the inventory book and the demurrage book.

An inventory should be taken at least once every six months, and no system can be properly carried out without a complete inventory being made at the commencement of the system and periodically thereafter. While taking this inventory, certain materials are found that have probably been in stock for years and have become obsolete. These should be written off, as otherwise a balance cannot properly be established between the inventory and the current material. Useless and worn-out fittings that have been repaired and refitted should be credited to the distribution from which they arrive, according to the depreciation, and after repairing should be issued according to this depreciation charge plus the cost of repairs.

Material which cannot be used again should be sorted into separate piles. In the case of copper wire the insulation should be burned off and all materials be so cleaned that the best scrap market price can be obtained. No articles nor supplies should go into these piles that can be re-used, and a nice credit price can often be shown on the warehouse books owing to the scrap recovery.

An auxiliary warehouse may be used for storing material in the bulk form, such as cement, car iron, etc.

NAME OF COMPANY

STOREROOM REPORT — WEEK ENDING

DATE	REQ. No.	ORDERED BY	MATERIAL ORDERED	QUANTITY ISSUED	UNIT PRICE	TOTAL CHARGE	DISTRIBUTION

CLERK'S SIGNATURE — TOTAL $

FIG. 5. WAREHOUSE KEEPER'S WEEKLY REPORT TO HEAD OFFICE

The scrap metals can be kept here, and all large heavy castings that are seldom used. This relieves the general warehouse of such material which has a tendency to occupy considerable space. Only current material of convenient proportions should be stored in the wareroom.

In the material yard certain sizes of props and different weights of rail should be stocked in their respective piles,

all lumber and other perishable material being under cover or at least so piled that the weather has as little effect as possible. This material must be so placed that fire cannot reach it or, in case it does, that fire appliances are at hand for extinguishing the blaze.

Structural iron, tanks, large piping, etc., should be painted if left outside, as there is considerable depreciation from rust. If at any time a pump or other type of machine should be left outside, it should be protected from the weather. A few leanto sheds protect much of these supplies, and the warehouse clerk should be held responsible for such protection.

To carry out fully his duties in an efficient manner, the warehouse keeper must be held responsible for the labor handling the supplies, for the unloading of all materials, for the proper storing and care of material and for its proper delivery to the man requisitioning it. This may appear a large responsibility to place upon one man, but it is unfair for this man to be held responsible for any material unless he has its full control from the time it arrives at the mine to the time when it is turned over to the man who is to use it.

Sufficient help should be given the warehouse keeper to enable him to unload the cars as soon as possible, avoiding demurrage, to handle the heavy supplies in the wareroom and to carry out this handling efficiently. With the proper coöperation of officials and the proper understanding with the company, the warehouse keeper and his warehouse become a potent factor in the economical operation of the mine.

Extracts from a Superintendent's Diary

Today I was forcibly reminded of the fact that coal mining has become a very complex business. The directors of our company have an option on the properties of one of their competitors, and for some time they have been carrying on an investigation to determine their value. Today they sent me copies of the reports that the various experts employed by them had submitted, with a request that I look them over and make any comments upon them that I might consider pertinent. One of the experts happened to mention an article that I had contributed to one of the meetings of our State Operators' Association several years before, and that fact probably was responsible for my receiving the reports for criticism.

In the file were papers from an electrical engineer, a mechanical engineer, a mining engineer, a certified accountant, a railroad engineer, a building contractor, a sanitary engineer and a chemist. Every one of them found matters to comment on that were not only interesting to them, but made it necessary for them to draw on most of their past experience. And strange to relate, I was able to read the reports through without finding anything that seemed to require for its interpretation knowledge that I did not possess. In other words, without being conscious of it I have apparently become competent to qualify as an expert in all those different professions, and still I do not have more knowledge than is required by a coal-mine superintendent, since I have gained all of my knowledge during the ordinary course of events that come to such a superintendent.

When I realized that, I was all but lost in admiration of myself to think that I had become so accomplished. After a time, however, I managed to get control of my vanity and recalled that the reports had come into my possession quite by accident and that if I desired to profit by the accident I was wasting valuable time.

This conclusion caused me to go over the reports again, and I reread them all several times. Then I laid them aside to give my thinker a chance to chew on the cud of impressions it had accumulated.

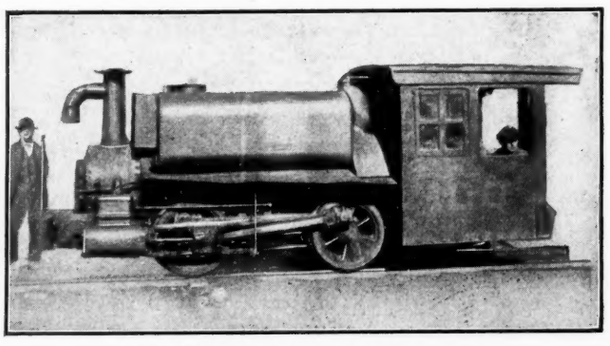
All the reports seem to blend together now, and the experiences and suggestions of the composite expert became my experience. How interesting those recollections were: Attempts to control and direct all classes of workingmen, from blacksmiths and carpenters on up through electricians and engineers; adventures with company salesmen who insisted on selling lump coal only when lump coal alone could not be produced at a profit; inaugurating sanitary regulations when those who should have been most concerned refused to display any interest; establishing a market for high-volatile coals in a district where only low-volatile coals had been used and were understood. My adventures and experiences have been varied, to say the least, and they have not been exceptional, I am sure.

Not once in all my years at the mines had it occurred to me that there was anything remarkable in the fact that I had under my direction a blacksmith shop, a carpenter shop, a machine shop, an electrical repair shop, a power plant, to say nothing of an entire village. In all the range of industry what other business requires the services of men from such a number of different trades in its everyday routine?

I was now competent to do something that not one of the experts employed by my directors could have done. I wrote out a report that summed up all those submitted, and unless I am badly mistaken I shall hear from that report again.

Locomotive Used Under Breakers

The accompanying illustration shows a form of locomotive used by the Lehigh Valley Coal Co. for work under breakers. A side branch whose outer end is turned



LOCOMOTIVE FOR BREAKER USE

down is attached to the smokestack. The upper end of the main stack is provided with a damper, which is controlled from the cab. When this damper is closed, the smoke and cinders pass through the branch and are directed downward away from the timbers, so that there is very little danger of fire being caused by sparks from the locomotive lodging against beams or other wooden building members.

A New Firedamp Detector*

By George A. Burrell†

SYNOPSIS—Describes an apparatus in which methane is burned. The reduction in volume resulting shows without complication how much methane was present within 0.1 per cent.

A new gas detector has been developed at the Pittsburgh Experiment Station of the United States Bureau of Mines which, it is believed, fills a recognized need for a device that will detect gases in mines and other places and that is simple in construction and operation, light, rugged and accurate.

Fig. 1 shows the assembled detector. Brass and aluminum are used throughout in its construction, except in the glass tube at the right. The weight of the instrument is 1.4 lb. Having a flat base, the detector can be stood up readily when not in use. The time required to make a test is barely 2 min.

The apparatus, shown in Fig. 1, was planned so as to derive from a miner's cap lamp or hand-lamp battery the small amount of electrical energy required for its operation. The current is switched from the cap lamp to the gas detector for a space of less than 1½ min., the cap lamp being kept burning.

Detector Will Test for Any Combustible Gas

The device can be used for detecting the methane in mine air or the presence of natural gas, gasoline vapor, hydrogen or gas made by destructively distilling coal. It can also be used for detecting carbon monoxide in flue gas, carbon monoxide, water gas or any other combustible gas in air.

Referring to Fig. 2, it will be seen that the device consists of seven parts, the aluminum castings *X* and *Y*, the standard brass tubing *A*, the stout gage glass *C*, the aluminum scale *O*, the brass reservoir *H* and the brass top piece *P*, carrying a platinum wire *F*. A valve *V* seats itself into this top piece *P* and two binding posts *M* and *N*, for electric connections are shown connecting with this platinum wire, which can be heated when the current is switched on. The latter can be observed when hot by peering through the small glass window *E*. This small window is amply protected against breakage by being embedded in the casting *Y*. A bale *T* is provided for carrying the instrument.

The aluminum scale is provided, as shown, with four separate graduation columns. One of these is for showing percentages of methane or natural gas in air, another has graduations marking the percentages of gasoline vapor in air, another serves the same purpose for hydrogen in air and a fourth is used to evaluate the percentage in air of coal gas—gas made by destructively distilling coal.

Thus, the instrument is not limited to use in mines or to the detection of methane (firedamp), but can be used for proving the presence of any combustible gas, such as gasoline vapor in the atmosphere around places where gasoline is stored, hydrogen around storage-battery installations, natural gas and coal gas in buildings, etc.

The instrument can be considered to be a U-tube, of which *A* and *C* are the two branches, the arrow at *B* showing the connection between them. To make the device ready for use the top piece *P* is unscrewed and water is poured into *A* until it fills the two branches *A* and *C* and rests in *C* at the point *S*, the zero point of the scale. The water will have then sought its level at a corresponding point in *A* (at *Q*), just below the platinum wire *F*.

To make a determination of combustible gas in air, say methane in mine air, the valve *V* is opened, and by

FIG. 1. THE GAS DETECTOR SHOWN ASSEMBLED

means of a short rubber tube attached to *R*, the operative blows gently into the reservoir *H*, thus depressing the water column in *C* to some point in *B* and forcing it up above *Q* until water appears in the little cup *K*.

But it is not necessary to see the ascent of the water to that point. A slight click in the valve *V* when the water strikes tells the gas tester that it has risen to the required height. Then a rubber tube attached to *R* is pinched with the fingers, and the instrument raised to the roof of the mine or moved to any place where the sample is to be collected. When the gas tester has the opening at the selected point, the rubber tubing is released.

The water immediately falls to the point *Q* and rises in *C* to the point *S;* in other words it comes back to its original position. The water, in falling to *Q*, sucks in a sample of the air to be tested. This sample rests in the combustion space above the water at *Q* and in contact with the platinum spiral *F*. The valve is then closed, and the spiral is electrically heated. Any combustible gas in the sample immediately begins to burn and at the end of 1½ min. is completely consumed.

Then the electric current is turned off, and the instrument is shaken, thus forcing the water into the combus-

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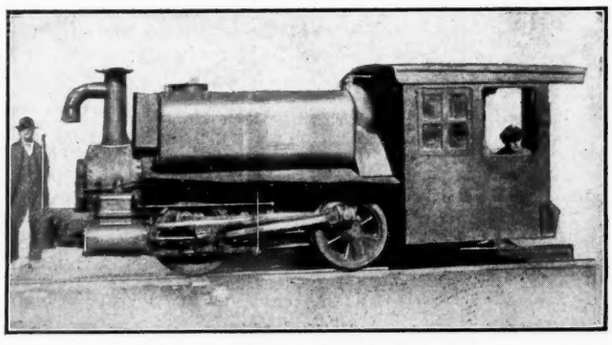

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Fig. 1 shows the assembled detector. Brass and aluminum are used throughout in its construction, except in the glass tube at the right. The weight of the instrument is 1.4 lb. Having a flat base, the detector can be stood up readily when not in use. The time required to make a test is barely 2 min.

The apparatus, shown in Fig. 1, was planned so as to derive from a miner's cap lamp or hand-lamp battery the small amount of electrical energy required for its operation. The current is switched from the cap lamp to the gas detector for a space of less than 1½ min., the cap lamp being kept burning.

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*The article here published represents roughly the address of Mr. Burrell before the West Virginia Coal Mining Institute, Dec. 8, and before the Coal Mining Institute of America, Dec. 22, 1915. It is published with the permission of the Director of the Bureau of Mines.

†Chemist of Gas Investigations, Bureau of Mines, 40th and Butler St., Pittsburgh, Penn.

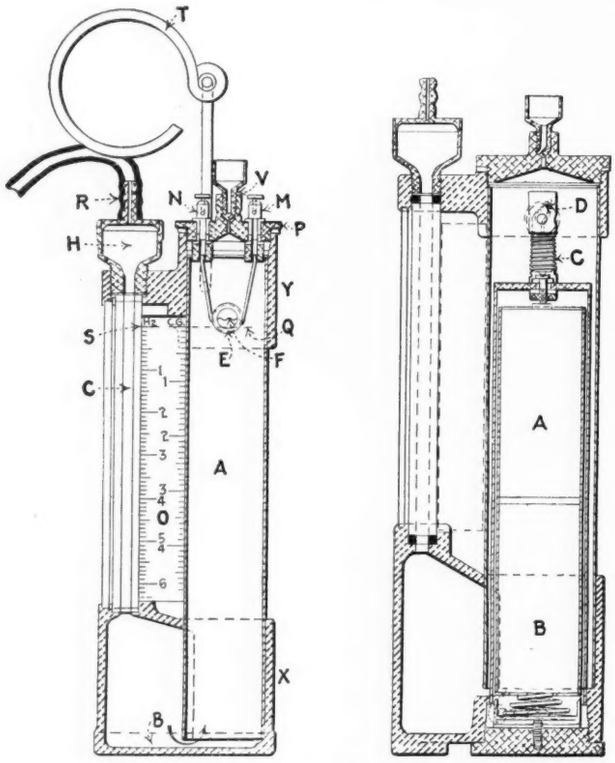
tion space above *Q* and cooling the gases. Immediately the water column in *C* falls to a point opposite the graduated scale, depending upon the percentage of methane present. From the level reached that percentage can be determined by the reading of a scale.

The principle of the operation is that methane upon reaction with oxygen burns as follows:

1 volume 2 volumes 1 volume

$$CH_4 + 2O_2 = CO_2 + 2H_2O$$

In other words one volume of methane reacts with two volumes of oxygen and forms one volume of carbon dioxide; or in the burning operation three volumes have contracted to one volume, the water vapor (H_2O) condensing



FIGS. 2 AND 3. DETAILS OF THE GAS DETECTORS

and occupying no appreciable space. Hence, if one burns a mixture of methane and air in the gas detector, the sample contracts. The water accordingly rises in the reservoir space above *Q* and falls correspondingly in the glass tube *C* to a point next the scale which shows the percentage of methane present.

Accuracy Is Greater Than Might Be Expected

So small a percentage as 0.1 per cent. of methane or other combustible gas can be detected. The platinum wire can be heated by means of the storage battery of a miner's electric cap lamp, the battery being carried on a man's belt as is the usual custom in handling these electric cap lamps and the current being switched from the lamp to the detector as the tests are made. But the lamp can be carried in the hand and connected to the detector by means of suitable leads, or it can be attached to the detector as an integral part.

The essential parts of the operation in making a test are these: (1) The operative blows into the instrument, thereby filling the combustion space with water. (2) The water above *Q* is allowed to fall, thereby taking a sample. (3) The electric current is turned on, thereby burning out the combustible gas. The valve is then closed. (4) The instrument is shaken to facilitate cooling, whereupon the water in *C* falls to a point on the scale showing the percentage of combustible gas.

If the detector is not shaken at the close of a test, thus forcing the water into the combustion space and cooling the gases quickly, cooling would be slow and it would be a matter of 5 min. or so before the gas in the combustion space would come to the original temperature of the gas before burning.

This equalization of temperature is necessary because a difference in temperature causes the gas to expand or contract and thus causes a shift of the water in the glass gage *C*. The aluminum scale of the instrument is easily removable so that the proper graduated side can be placed against the glass, depending upon the combustible gas that is being detected.

Fig. 3 shows a modification having two small dry cells for furnishing the electrical energy. This instrument is meant especially for use in coal mines and other places where small storage cells such as are used in connection with miners' electric lamps are not available. The construction and operation are essentially the same as in the case of the instrument shown in Figs. 1 and 2. Two dry cells last for a minimum of 20 determinations and cost about 7c. apiece. When the cells are used up, they are as readily removed as are the dry cells of the ordinary small dry-battery flash lights, such as are made by the American Ever Ready Co.

Ten Times as Sensitive as Safety Lamp

Referring to Fig. 3, it will be seen that the two small dry cells are shown at *A* and *B*. A screw plug *C* carries the small platinum wire *D* used for burning the combustible gas. In case this wire fuses or breaks, another plug carrying another wire can be quickly inserted. The device is 10 to 20 times as accurate as the safety lamp, weighs less and has less and more rugged parts.

The detectors have been tried out in the laboratory and in mines, and there is no doubt about their usefulness. Applications for patents have been filed by the Bureau of Mines, and at present means of exploiting the apparatus in such a way that the public interests will best be served are being considered. Such patent claims as will be granted abroad will be my own property.

I am indebted to Dr. G. A. Hulett, consulting chemist to the Bureau of Mines, for first suggesting the building of the apparatus herein shown, and to other members of the bureau who have furnished helpful suggestions.

Streams To Be Inspected for Pollution

Commissioner of Fisheries Buller has planned for an inspection of all Pennsylvania watersheds to ascertain sources of pollution of streams. In conjunction with other departments of the state government maps have been made of watersheds and the locations of all manufacturing plants, coal mines and other industries noted. The wardens will make inspections along all of the streams and report the extent the waters are being polluted and fish affected. Steps will then be taken to require the installation of filters.

The inspection will be started in the oil and lumber regions and then extended to those producing coal. The Susquehanna River in the anthracite region will be one of the last streams to be investigated.

Effect of Barometric Pressure To Derange or Stop Ventilation

By F. C. Cornet*

SYNOPSIS—A fall of barometer causes outflow of gas from mine wastes. Early practice of warning mine operators of approaching barometric changes. A fall of barometer generally accompanied by wind. Effect of surface winds to derange the air circulation in mines.

It has long been known that, although a fall of barometric pressure has practically no influence on the amount of gas liberated at the working faces, it may cause an outflow of gas-laden air from the gobs or waste places of the mine.

Since the year 1869, or shortly after the laying of the Atlantic cable, it has been the custom of the Royal Observatory at Brussels to notify the coal mines of Belgium, sometimes several days in advance, of any impending atmospheric disturbance. Most of the storms visiting that part of Europe come from across the Atlantic and are announced by cable from America. Hence it is quite easy for the Brussels Observatory to send its warning notice in ample time.

As far back as 1874 M. Henry Durant had equipped every fan engine of the Crachet-Picquery Collieries, at Frameries, Belgium, with what he called a barometric governor, which automatically increased the speed of the ventilator when the mercury went down and brought it back to its normal figure as soon as regular atmospheric conditions had returned. This apparatus registered continuously on a sheet of paper, which was changed weekly, not only the water gage and atmospheric pressure, but also the speed of the fan. The means of registering the latter was obtained through a curious centrifugal device that kept the marking lead-point at a height on the paper corresponding to the number of revolutions made by the fan.

Early Observation of Barometric Effect

The foregoing proves beyond a doubt that more than a generation ago the necessity of increasing ventilation in times of barometric depression was as well recognized as in our day. It does not seem, however, that any investigation was ever made to determine whether the wind, which in this country always accompanies a sudden fall of the mercury, has any influence on ventilation more direct or more immediate in its manifestation than the expansion of the gas-laden air contained in the goaf, which is rather slow in making itself felt.

Let us take, for example, a fan of the exhaust type, the chimney of which is exposed to a wind blowing at the rate of 70 mi. per hr. If the wind blows horizontally or in an upward direction, it may have no action on the air coming out of the chimney. But, if it blows downward, it will have a tendency to retard the air coming out of the mine through the chimney. The more the downward direction of the wind approaches the vertical the more accentuated will be the resistance offered to the current emerging from the mine. In flat, level countries the wind blows at all kinds of angles, downward and upward, sometimes as great as 45 deg., depending mostly on the closeness, the horizontal dimensions and the height of the constructions around and over which it blows. In hilly countries the angles at which the wind blows are generally much greater even than on level stretches. It is not hard to imagine that the 70-mi. wind mentioned previously might blow downward on the top of the fan chimney at an angle of, say, 30 deg. Such a wind striking squarely has a force of 14.7 lb. per sq.ft. (according to Montigny, though other authorities make this much higher). Multiplying 14.7 by sine of 30 deg. gives 7.35 lb. per sq.ft. as the force opposed by the wind to the air coming out of the mine. This is equal in effect to a water gage of 1.41 in. acting to reduce the effective gage in the mine.

Effect of Wind Pressure on Ventilation

It is clear that if a mine thus affected was ventilated under a water gage not exceeding 1.41 in., the effect of the wind would be to stop the circulation altogether. But, if the mine was ventilated under a water gage of, say, 3 in., the circulation would continue, though the action of the wind would reduce the gage to 1.59 in. Dividing the square of 1.59 by the square of 3 gives 0.28, which means that under the action of the 70-mi. wind, the amount of air going through the pipe would be but 28 per cent. of the regular amount. Instead of, say, 50,000 cu.ft., it would be only 14,000 cu.ft. per min.

It will be argued with reason that if the fan chimney is struck by the wind, so may be the opening through which the air finds its way into the mine, which would balance the retarding action of the wind at the top of the fan chimney. This, of course, may happen under certain conditions. The air inlet may be the top of a shaft or the mouth of a drift. But, the former is probably the hoisting shaft, in which case it is protected from the wind by such buildings, structures and fences as are ordinarily found around such places. The top of the downcast is never likely to be, like the top of the fan chimney, in a position most exposed to the free and unrestrained action of any wind that blows. When the air inlet is the mouth of a drift, this may also serve as a haulway for the coal, in which case it also is likely to be partly or completely sheltered, which prevents the wind from striking it.

Should the inlet drift mouth be free and favorably exposed, the wind may so blow into it that it will help ventilation and overcome to some extent, or perhaps entirely, the retarding influence of the wind on the top of the fan chimney. But in order to do this the wind must blow from a direction included within a half-circle around and in front of the drift mouth, while the top of the fan chimney is struck by winds blowing from all quarters.

It seems as if no exhaust fan ought to be considered complete unless a roof or platform is built over the chimney, high enough above it and projecting sufficiently all around to allow the air to flow out of the mine unob-

*Consulting mining engineer, Charleston, W. Va.

structed and without any danger of being retarded by wind blowing in a downward direction.

All that has been said so far has had reference to exhaust ventilation only. In the case of force fans the wind may hinder or assist ventilation and will do this whether blowing horizontally or in a downward or upward direction. It is easily understood that a strong wind blowing well into the inlet of a force fan will increase the volume and velocity of the ventilating current. This will be most appreciable with the reversible fans, where a system of doors is provided to allow the reversing of the air current in the mine. When the inside doors are shut and the outside doors open, the fan is blowing. Now, if as is generally the case, both outside doors face in the same direction and the wind blows strongly from that side, the conditions are favorable for a noticeable increase in ventilation, especially if the water gage producing ventilation is low.

Let us suppose that a 70-mi. wind blows squarely through the outside doors of a fan that has previously been delivering 50,000 cu.ft. of air, at a water gage of 1 in. and a velocity in the main aircourse of 620 ft. per min. The full force of the wind, 14.7 lb. per sq.ft., corresponding to a 2.82-in. water gage, will bear on both inlets of the fan, raising the gage under which the mine is ventilated to 3.82 in. Without any increase in the number of revolutions or the horsepower, the fan will deliver under the new conditions 97,500 cu.ft. per min at a velocity of 1,209 ft. per min. In most instances such an increase in velocity, nearly 100 per cent., would be objectionable, especially in a dusty mine.

Peculiar Effect in a West Virginia Mine

Several years ago I had to investigate a curious and very interesting case of this kind in a shaft mine of West Virginia. A wind of variable intensity blew, sometimes for several days, from the southeast squarely into the outside doors leading to the inlets of a large fan working at a water gage less than 1 in. The variations in the force of the wind were plainly felt in the mine, where the velocity of the ventilating current increased and decreased several times every hour, rising in a brief second from a state of gentle breeze to one of furious gale. After running at this gait for a few minutes, it would fall back instantaneously to a normal condition, only to resume after a short time its express-train speed through the mine, and so up and down and up again as long as the wind blew from the southeast with any intensity.

Things were very uncomfortable in that mine, to say the least. It made everybody nervous, especially the superintendent who, being unable to understand what the cause of the trouble was, gave the name of "spells" to the vagaries of the ventilating current. The proper thing to have done would have been to shield the outside doors leading to the fan inlets in such a way that the southeast wind would have been unable to derange the ventilation. Although advised to do so, they never did it, preferring to barricade the airway at the foot of the downcast until they had increased the water gage to nearly 3 in., when the southeast wind ceased to be troublesome. But by this time they had fired the spare boiler in the powerhouse and put one more fireman on their payroll. This is a way they have of remedying things, which is not quite as rare as one would be inclined to believe.

Just as a blowing fan may be helped by the wind blowing into the inlets it may be baffled by the wind blowing against the outlet through which the ventilating current leaves the mine. There may be several outlets. These would be seldom so placed in relation to each other that the wind would bear adversely against more than one at a time. When the outgoing current is divided in this manner, the water gage for each division or air split is always smaller than the gage at the fan. Consequently, a division or split may be stopped by a smaller adverse pressure than would be required to stop the whole of the ventilating current, were this forced to go out through one outlet with the full gage of the fan drift against it. The hindering or stopping of the air current at a divisional outlet would affect only part of the mine and would probably act to increase the amount of air passing through the other outlets.

Surface Wind May Reverse the Ventilation

Only the case of a single outlet will be considered—the mouth of a drift on a hillside, exposed to the free action of the wind, the fan ventilating this mine works under a water gage of 1 in. Suppose that a 70-mi. wind is blowing in the same direction as the course of the drift and that this wind blows downward or upward (which makes no difference in this case) at an angle of 45 deg. As previously noted, a 70-mi. wind striking squarely has a force of 14.7 lb. per sq.ft. and, multiplying this by sine 45 deg., gives 10.29 lb. per sq.ft. as the force that is brought to bear against the current coming out of the mine. This corresponds to a 1.98-in. water gage, which overcomes the fan's action and reverses the ventilating current, making it travel toward the fan under a gage of 0.98 in. A volume of air practically as large as before will ventilate the mine, but in an opposite direction. Such a case as this was remedied by erecting, 15 ft. outside and in front of the air outlet, a pile of mine props 60 ft. long and 20 ft. high. This acted as a screen and answered the purpose perfectly and is still doing the work.

Why Are Coal-Mine Strikes of Such Frequent Occurrence?

Hugh Archbald takes exception to the editing of the second of his articles under the above title which appeared in *Coal Age,* July 24, 1915, p. 124. Especially does he object to the following introductory sentences, introduced to carry the reader's thought forward: "One of the causes for the frequency of strikes is the company house on which the miner feels undue profits are made" and "Another cause for strikes is a desire for a recognition of the union."

Mr. Archbald desires to be clearly understood as follows: "The thing that causes strikes is the desire for a decent living. If men cannot earn enough money to purchase this living, they are dissatisfied. When the dissatisfaction becomes acute, they combine into some form of organization and make a struggle to obtain that which they desire. In mining in many places the men are dependent on the management of the mine for the conditions under which they live. This struggle results in strikes. My whole theme was an amplification of that thought in three stages."

Coal Stripping, Rush Run, Ohio

SPECIAL CORRESPONDENCE

SYNOPSIS—Coal seams in eastern Ohio, being generally level, are mostly worked through tunnel openings. The abandonment of many farm lands has led to large stripping operations to recover the coal in the upper seams hitherto unmined. Description of the general method employed and the equipment required.

While coal stripping has been carried on extensively both in the anthracite fields of northeastern Pennsylvania and in the West, especially in Illinois, it has not been in evidence in the coal fields of Indiana and Ohio. Considerable attention is now being attracted, however, to the stripping operations recently started in eastern Ohio, near the Ohio River.

Coal seams, varying from 3 to 6 ft. and over, outcrop along the river hills. Many of these seams have been worked by horizontal tunnels and gangways, because the seams are nearly level, and the coal is lowered over steep inclines to tipples located so as to load either in cars or in river barges. Many of these seams lie under such a deep overburden that there is no practical way to perform the mining, except by driving tunnels and gangways.

There are quite extensive areas, however, in this district that have an overburden varying anywhere from 5 to 50 ft. Heretofore, these seams have not been worked, because stripping was not thought practical, and there was no roof for the regular method of mining. Then there was the additional reason that stripping would destroy the land for farming. This is a real and vital objection to stripping operations, but it has been overcome in some sections by a trend of events similar to those that have made the abandoned farms in New England. In numerous cases the farms of New England have become either wholly or in part worked out. Besides this, many old-time families have passed away, and the farms are now owned by heirs who have never lived on the land and in many cases by persons who have never seen the property. Much the same condition exists in respect to the farm lands overlying valuable coal property in Ohio.

Here, then, has come the opportunity for the stripping operator. Various companies have bought up a considerable acreage of coal lands, and the heirs of many of these estates are making inquiries in regard to the value of the coal and are anxious to either sell the land outright or lease the mining rights and privileges.

Stripping operations are now being carried on near Rush Run, which is on the Ohio River a few miles above Wheeling, W. Va. One plant is located about two miles from the river, another several miles farther inland, near Smithfield, and operations at a third location are being planned. A coal spur from the Pennsylvania and the Lake Erie lines has been extended up Rush Run to reach these plants.

The work now in progress began in January, 1914, and is being carried on by the Beech Flats Coal Co., of Danville, Ill. One of these tracts includes 200 acres, and so far about 25 acres has been mined. The coal seam averages 6 ft. in thickness, and the overburden ranges from 8 or 10 ft. to over 30 ft. The capacity of the plant is from 18 to 24 standard cars of coal per day.

FIG. 1. STRIPPING THE COAL WITH THE LARGE SHOVEL

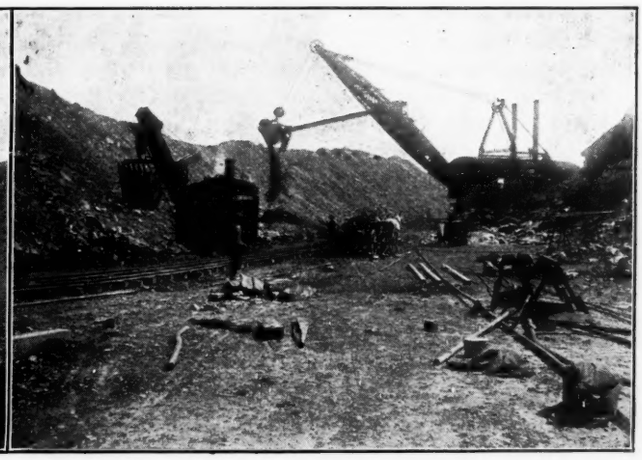


FIG. 2. SMALL LOADING SHOVEL FOLLOWING THE STRIPPING

The equipment is as follows: One monster Marion revolving steam shovel; one Marion coal-loading steam shovel; one portable Ingersoll-Rand, 3-phase electric air compressor to operate the air-plug drills used in drilling the holes to shoot the coal. The equipment also includes about one mile of trackage and two dinkey locomotives and trains of pit cars for hauling the coal to the incline, a feed-water pumping plant to supply the boilers of the locomotives and steam shovels. There is also a head-house and a gravity incline having two 10-ton cylindrical cars for receiving the coal from the pit cars and delivering it to the tipple, which is electrically operated. High-tension 3-phase electric power is available from the public-service lines extending along the Ohio River. About 60 hands are employed in the operation of the plant.

The success of coal-stripping operations, while primarily requiring particularly good organization and business methods, depends to a greater extent upon the monster revolving steam shovel used to remove the overburden. The largest shovel that can be produced, such as the 8-

yd. Marion, is essential, and no stripping operation should be considered without having a shovel of this type in the outfit.

The method of mining is shown in Fig. 1 and consists in working the large shovel back and forth over the full length of the tract. This stripping shovel leaves a strip of land about 50 ft. wide where the coal is uncovered. The top surface of this coal must then be cleaned off, and this is done by hand with picks, shovels and brooms.

Mixing and Loading the Coal One Operation

The loading shovel, shown in Fig. 2, now operates back and forth along the edge of the coal, on a level with the floor of the seam. A strip about 12 ft. wide is mined by the shovel on each trip. The coal is loosened by charges of "F" black powder, placed in 1¼-in. holes. It takes about half a minute to drill each hole, using a six-pointed air-drill bit, the drill being held by one operator. The holes are placed about 9 ft. apart, and the charges of powder vary from ½ pint to one quart, according to the judgment of the driller and shooter. The wetter the spot the more powder is required. The charges are tamped with coal cuttings and fired by means of a squib, the whole operation of drilling, loading and firing not taking much over one minute. One man does all this work and has time to spare for resting.

The dinkey locomotive handles the string of pit cars while the loading proceeds. By means of the two locomotives and trains, the loading is carried on almost continuously. The loading track extends along and close to the edge of the standing coal.

Advantages of the Stripping Method of Mining

For speed and safety as compared with the underground mining, the stripping method is ideal. Also, this method is a case of mining without miners. One drawback is the layoffs on account of bad weather and breakdowns in some of the important units. But the layoffs can be reduced greatly by good organization and planning.

It is claimed that the cost of this system of mining by removing the ordinary overburden is 30c. per ton, and a quotation of 50c. per ton has been made on prospective acreage with a heavier and more rocky overburden.

The coal stripping absolutely destroys the land for farming purposes. The overburden, which is made up of soil, hard shale, clays and more or less solid limestone, is stacked up on the mined area by the big shovel in ridges higher than the level of the undisturbed formation. This ground is left so rough that it is extremely difficult to walk over it. The material in these stacks is bottom up, as far as the soil is concerned. It is hard to imagine what further use could be made of such land. A way may be found some day to get enough value from the stripped land to reimburse the owners for the taxes that must be paid yearly.

Benzol Output at Coke Plants

In response to the unprecedented demand for high explosives a new industry—the recovery of benzol and toluol—suddenly sprang into existence in the United States in 1915. Benzol and toluol, indispensable raw materials from which explosives, dyestuffs and other chemical products are manufactured, are oils similar to gasoline in appearance and smell and are present in the gas that is driven off from coal when it is made into coke. Before the European War the demand in the United States for these products was so small and the price so low that but one company engaged in coke making sought to recover them on a large scale. Late in 1914 the price of benzol and particularly toluol rose to such a point that many other companies began to build plants to recover these oils, which were then being burned with the gas, and by the end of 1915 there were 19 new plants for benzol recovery in operation and others in course of erection.

Production of Benzol in 1915

Reports made to C. E. Lesher, of the United States Geological Survey, by all the byproduct coke plants in the country indicate that the output of benzol and other light oils in 1915 amounted to 13,942,763 gal., in connection with which there was produced 761,256 lb. of naphthalene, a solid crystalline substance. Some of the benzol-recovery plants, which consist essentially of a complicated system of absorption towers, pumps, stills and storage reservoirs, were in operation at the beginning of the year, but many were built during the early months of 1915 under contracts calling for great speed in erection. Several of the plants are not equipped to separate the different oils found in the crude, and 7,322,670 gal.—more than half of the total output—was reported as crude benzol and light oil and was shipped in tank-cars to refineries connected with powder works and other chemical industries. In the 6,620,093 gal. of oils refined at the place of recovery there were 4,833,939 gal. of 100-per cent. benzol, 1,315,727 gal. of toluol, and 470,425 gal. of solvent naphtha.

Thirty-one coke-making establishments with 4,933 byproduct ovens contributed to this total, and it is estimated that between 8,000,000 and 9,000,000 tons of coal was carbonized in the ovens that furnished the gas from which the oils were recovered. The annual capacity of the benzol-recovery plants now in operation is estimated at over 20,000,000 gal., and with the completion of plants now building will probably exceed 22,000,000 gal. The value of these products is indicated by the prices currently reported during the year. Benzol, normally selling for 20c. or less a gallon, in September brought as high as $1.25 for immediate shipment and 65c. on contract; toluol, with a normal price of 25c., was sold for as much as $6 a gal. for immediate delivery and was contracted for at $4.25 per gal.

Benzol is an excellent motor fuel. The United States, whose output of gasoline is estimated in 1914 at 30 to 50 million barrels (1,500,000,000 to 2,500,000,000 gal.), stands in no need of additional supplies for this purpose. There is, however, in the United States in normal times a large use for dyes and chemicals, such as carbolic acid, which depend upon benzol and toluol for raw material and which have in the past been largely imported.

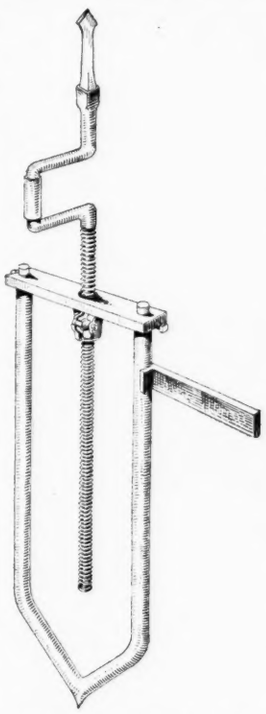
After the war demand for explosives is over and the price of benzol returns to normal, serious effort will of course be made to find a market for this product. Shut off from European competition, the dye and chemical industry in the United States is now making rapid strides forward. If this industry after the close of the war is able to hold its own against the highly developed foreign competition, it may absorb the output of benzol and add another source of income to the coke-oven plants.

A One-Man Roof Driller

By James T. Reynolds*

The recent descriptive sketch in *Coal Age* of a useful jack for boring holes in roof strata suggests to the writer that the one outlined here will be perhaps in some instances still better adapted for the purpose.

The machine in its entirety was constructed by the mine blacksmith at a mine where I worked when the foreman and I through urgent need of just such an apparatus, drew the rough sketch of this jack for the smith to work from. The outfit weighs but 30 to 35 lb. and consequently not only can be operated by one man, but can be carried from place to place by the operator himself. About all the materials needed are several feet of round or square iron ¾ to 1 in. in diameter, bent into the shape of an exaggerated tuning fork with a steel pick point at the foot to give a good hold in the bottom and prevent easy wear. Propulsion is accomplished by a common coal or rock-drill thread bar with the bit-socket cut off and a crank welded on. The split-box is made with a thumbscrew to admit of the thread-bar being lowered or raised, and above this is affixed a piece of harness leather to prevent the drillings from falling in and clogging up the box threads. The frame need be only about 8 in. in spread and about 3 ft. high to be used where the seam runs from 5 to 7 ft. thick. A projection of iron about ½x2½ in. is welded onto the frame, over which the operator straddles. This enables him to hold the machine firmly and rigidly and admits of the use of both hands if the hardness of the strata demands it when turning the crank. A steel bit 6 or 8 in. long completes the outfit.



THE DRILL READY FOR OPERATION

*Mining engineer and geologist, Charleston, W. Va.

Handling Explosives in Mines

The Institute of the Makers of Explosives has recently issued the following "Recommendations for the Use and Handling of Explosives":

1. Do not smoke while using or handling explosives of any kind.

2. Do not handle explosives near open lights, but see that lights are at a safe distance from the explosives.

3. Do not use any tools other than wooden wedges and wooden mallets for opening cases and boxes containing explosives.

4. Do not drive a hole in a keg of blasting powder with any iron or steel tool, but open the keg by removing the slide from the bung.

5. Do not use frozen or chilled explosives.

6. Do not cut or break any frozen or chilled cartridge of dynamite or other explosive.

7. Do not heat the thawing house by steam under pressure, unless provided with an effective heat-regulating device.

8. Do not thaw high explosives over or in front of a steam boiler or fire, or on heated stones, bricks, rocks or metal surfaces, in hot sand or ashes, or in an oven or stove.

9. Do not place high explosives directly over the heated metal coil or radiator of a thawing house heated by steam or hot water.

10. Do not expose dynamite or other high explosive to the direct rays of the sun.

11. Do not use metal tamping sticks or tamping rods in loading or tamping (stemming) explosives.

12. Do not force a cartridge of high explosive into a bore hole.

13. Do not attempt to charge a sprung, chambered or pocketed bore hole until cold. It is advisable to allow the hole to cool overnight before the final charging.

14. Do not use old wire for connecting blasting caps with each other.

15. Do not connect up or load bore holes for electric firing during the approach or progress of a thunderstorm, and if charges are already loaded and connected, all persons should be kept at a safe distance from them during the progress of the thunderstorm.

16. Do not allow wires or cables carrying electric current near detonators, explosives or charged bore holes at any time, except for the purpose of firing the blast.

17. Do not fire a blast before all persons are at a safe distance or under sufficient cover and all explosives are in a safe place.

18. Do not go near a misfire until at least a half hour has elapsed.

19. Do not dig out a charge of explosive which has misfired.

20. Do not lace fuse through dynamite charges.

21. Do not cut fuse on a slant, but cut it square across. Cut off an inch or two of fuse to insure having a fresh end in the blasting cap.

22. Do not use short fuse; cut fuse sufficiently long for perfect safety.

23. Do not crimp blasting caps to fuse with pliers, knife blade or with the teeth, but see that the blasting cap is securely attached to the fuse by means of a suitable cap crimper.

24. Do not allow priming (placing of a detonator in the dynamite cartridge) to be done in a thawing house or magazine.

25. Do not make up primers; that is, do not insert a blasting cap or an electric blasting cap in the cartridge before it is actually necessary.

26. Do not use any detonators (blasting caps or electric blasting caps) weaker than a No. 6.

27. Do not carry blasting caps or electric blasting caps in the pockets of clothing.

28. Do not store blasting caps or electric blasting caps with dynamite or other high explosive or with blasting powder.

29. Do not carry blasting caps or electric blasting caps in the bed or body of any vehicle which contains other explosives.

30. Do not store blasting caps, electric blasting caps, high explosives or blasting powder in a residence, home, boarding-house or any other human habitation or leave them where children can get hold of them.

31. Do not use dynamite or blasting powder with permissible explosives in the same bore hole in coal mines.

Government Pinched for Vessels

Evidence of the scarcity of vessels is seen in the following tentative inquiry issued by Paymaster General McGowan of the Navy Department under date of Jan. 7:

It is desired to ascertain the approximate cost per ton at which coal may at this time be transported from Atlantic range ports to Tiburon, Calif.; also from Atlantic range ports and Tiburon, Calif., to the Philippine Islands.

It will be appreciated if you will please advise by return mail what you consider to be the prevailing rate for merchant transportation of the nature referred to, the estimated capacity of a steamer that would be suitable for this purpose being about 5,000 tons cargo and the daily guaranteed rate of discharge at Cavite-Olongapo and Tiburon, Calif., being 400 tons.

In submitting your quotations, it is desired that the usual canal tolls be not figured in your price, as in the case of a vessel using the Panama Canal route the tolls would be assumed by the Navy Department.

It is not intended that this inquiry shall be regarded as an invitation for formal tenders, as it is issued merely to fix as nearly as practicable the prevailing market rates for transportation to the places named.

Coal Stripping in the West

By H. S. Mikesell*

Extensive stripping operations have long been conducted in Pennsylvania. More recently large strip pits have been opened up in Indiana and Illinois, Kansas and Oklahoma. The method is to remove the cover or overburden when of limited thickness—say not to exceed 40 ft.—by mechanical means, exposing the underlying bed of coal.

A stripping operation is now being developed near Lehigh, Okla., which will uncover a large area. The Missouri, Kansas & Texas R.R. has built a spur to the property and placed a contract with the owners for a considerable tonnage to be used for locomotive fuel.

The Globe Coal Co., Indianapolis, recently purchased 800 acres of land 15 mi. southeast of Terre Haute, Ind., for what is reported will be the largest stripping enterprise in the state. It is estimated that 8,000,000 tons of coal underlies the land, two-thirds of which can be stripped and removed by steam shovels. Of this coal 250 acres will be mined by slope openings. Two steam shovels, each with a capacity of 1,000 tons daily, are about to commence the removal of the overburden.

The Ehrlich-Pierce Co., of Turner, Ind., has begun work on a stripping project near Staunton, comprising 1,000 acres of land. There are several other strip pits in Clay County mining bituminous block coal at a depth of from 9 to 30 ft., and in this locality steam shovels are developing profitable measures which could not be handled advantageously in any other way.

Another recent development is located near Spillerton, Ill. A steam shovel has just been purchased, and removal of the coal will shortly begin. The vein is 8 ft. 4 in. thick, and the coal is pronounced by experts to be the equal of any mined from shafts in Williamson County.

For many years past a limited amount of coal has been extracted by stripping the overburden with plows and scrapers drawn by horses or mules. Such operations skirted the outcrop or the edge of the coal measures in various Western fields. In recent years through the medium of steam shovels of a capacity and weight materially in excess of the heaviest machines used in the construction of the Panama Canal the work of stripping coal in several Western states has been commenced.

Some of these shovels have a working weight of 250 tons, handling 3,000 cu.yd. of earth, shale and slate daily. The dipper has a capacity of 5 cu.yd.; the length of boom is 90 ft. from center to center; the dipper stick is 54 ft. in length; and the machine is capable of raising its load to a clear lift of 63 ft. above the top of rail, with a lateral reach from center of machine to center of dump of 103 ft.

After the coal is uncovered it is prepared for loading by shooting with small charges of black powder placed about 4 ft. from the face, the coal usually being loaded by hand into tramcars, which are gathered with mules and conveyed to a tipple by light steam locomotives, moving over temporary tracks in the pit. In some instances the cars are lifted out of the pit by a cantilever crane, which after hoisting them to the surface level, places them upon tracks for movement to the tipple. This tipple is equipped with screens for making the usual sizes.

Some of the stripping operations opened in Illinois and Indiana during the last two years have proved quite profitable. The shaft mines have suffered from the competition with fuel thus produced, and strip coal has been one of the factors tending to demoralize the price situation in Indiana. To insure steady operation, strip coal is sold from 10c. to 30c. per ton under the price of shaft-mined coal in the summer months, and the strip pits thus far opened in Indiana have been in constant operation throughout the year. The cost of production in Indiana and Illinois is said to range from 35c. to 65c. per ton on a mine-run basis.

A number of new strip pits are about to be opened in Indiana and Illinois, and several new ventures of this kind are contemplated in Oklahoma and Kansas. The competition of stripping production with shaft-mined coal would be a serious matter for future consideration if the amount of strip coal available was not limited.

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Editors Visit Anthracite Field

In *Coal Age* of Nov. 20, page 845, attention was called to the visit of a large number of metropolitan editors to mines and villages in the hard-coal districts of Pennsylvania. Practically all of the three days spent on the trip was devoted to a hurried but detailed automobile tour through the towns and operations of the various important mining companies. The highest officials of the anthracite companies acted as guides to the literary contingent and answered all questions concerning the production of coal and the general treatment of employees.

During the trip a large number of interesting photographs were taken, and the views that follow are some of the more important ones. In fact, the views shown on the following pages cover the trip in a more comprehensive manner than could be done by a mere description.

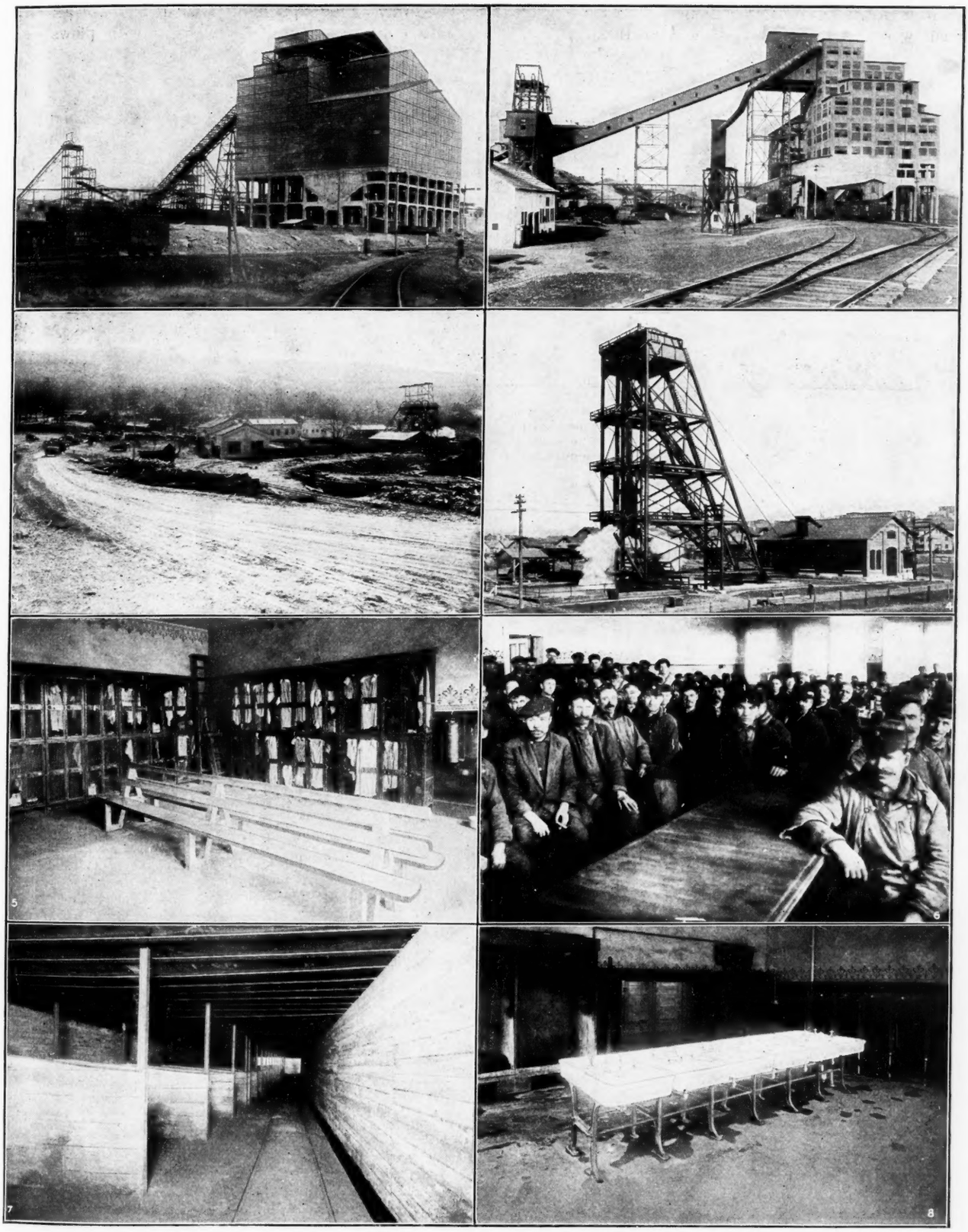

Fig. 1—D., L. & W. R.R. Co.'s Loomis breaker under construction. Fig. 2—The only all-concrete breaker in the world at Taylor, Penn. Fig. 3—Electric power plant of L., C. & N. Co. at Lansford. Fig. 4—Central water shaft, D., L. & W. R.R. Co., Scranton. Fig. 5—Locker room, Prospect colliery, L. V. Coal Co. Fig. 6—Mess room, Prospect colliery. Fig. 7—Mule barn, D., L. & W. R.R. Co.'s Truesdale colliery. Fig. 8—Wash room, L. V. Coal Co.'s Prospect colliery near Wilkes-Barre, Penn.

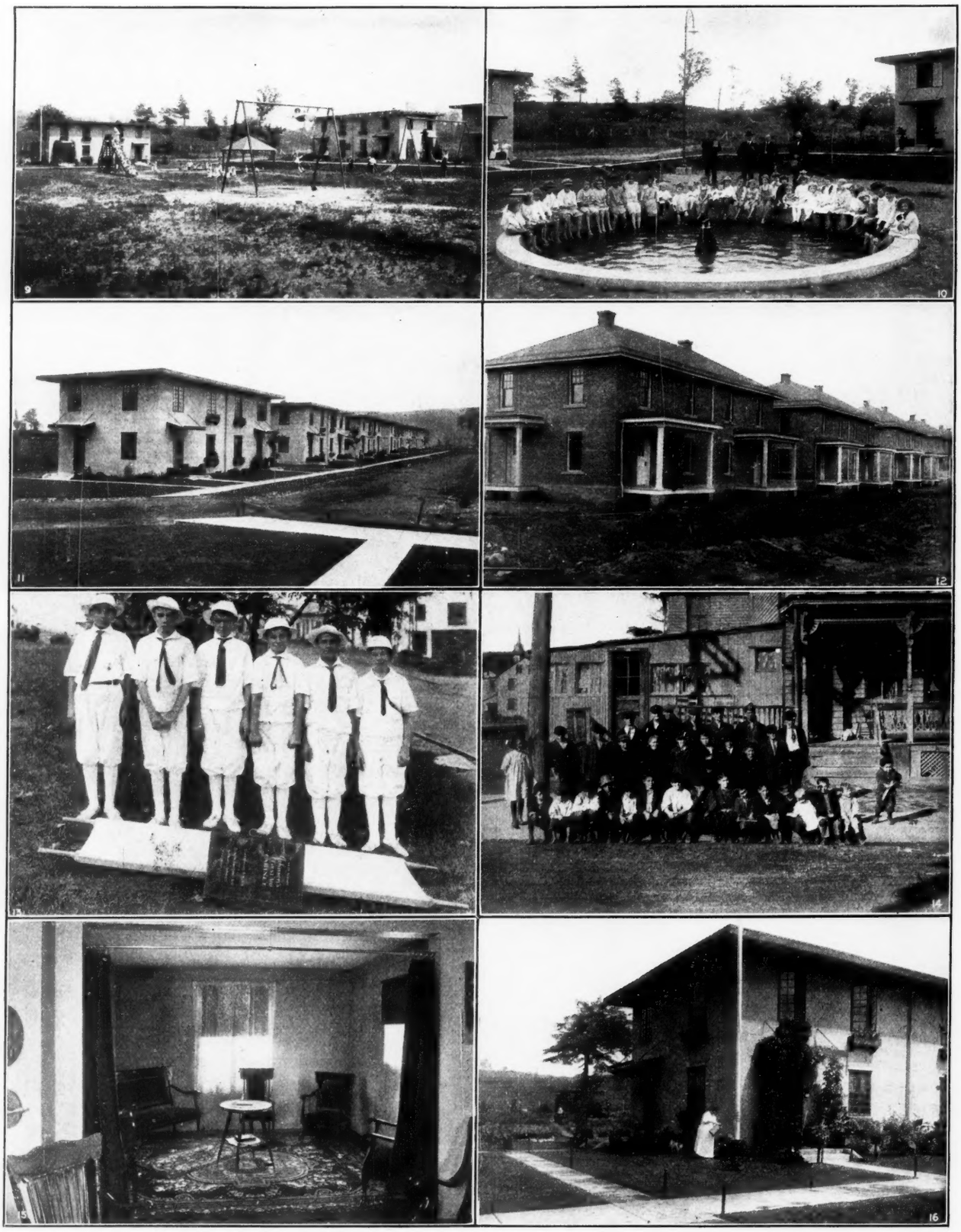

Fig. 9—D., L. & W. R.R. Co.'s Concrete City playground. Fig. 10—Swimming pool in Concrete City. Fig. 11—A street in Concrete City, showing homes of miners. Fig. 12—A section of D., L. & W. R.R. Co.'s Loomis Park under construction. Fig. 13—Breaker boys, Woodward mine, D., L. & W. R.R. Co. Fig. 14—A typical group of miners' children. Fig. 15—Interior of a house at Concrete City. Fig. 16—Second-prize garden, Concrete City house No. 27, occupied by John Martin

Fig. 17—Mineral Spring colliery, Wilkes-Barre, Penn.—the "Parlor Colliery" of the Lehigh Valley Coal Co. and the most beautiful coal-mining operation in the anthracite coal regions. Fig. 18—Underwood colliery, Olyphant, Penn., property of the Pennsylvania Coal Co. Fig. 19—New type of miners' homes that are rapidly replacing frame structures. The houses here shown belong to the Lehigh Coal and Navigation Co. Fig. 20—Old types of miners' homes that are rapidly disappearing. Fig. 21—A scenic view from Hauto, Penn. Fig. 22—At the burning mine, Summit Hill, Penn.—burning more than three-quarters of a century; property of Lehigh Coal and Navigation Co. Fig. 23—Jeddo No. 7 strippings, Harleigh, Penn. G. B. Markle Co.'s property. Fig. 24—Another view of the G. B. Markle Co.'s Jeddo No. 7 strippings

The Storage of Coal--II

By John B. C. Kershaw*

SYNOPSIS—A discussion of the action of air upon coal, showing how such action changes weight and reduces the calorific power. It is shown that it is better to allow old supplies of coal to stand and to use the new supplies if the least losses from weathering are desired. The cause and prevention of heating and firing coal in storage.

Nearly all coal suffers slow oxidation in air and some loss of the volatile constituents of the fuel, the depreciation in calorific value being greater with the soft and friable coals which yield high percentages of volatile constituents on heating.

Lecrivan, who has made a special study of the action of air upon coal, distinguished the following well-marked stages in this process of slow oxidation:

1. The physical state of the coal is altered. Surface oxidation causes minute fissures which rapidly extend right through the lumps; thus the size of the sound pieces continually decreases.

2. A change of weight occurs in three stages—(*a*) loss by escape of moisture and occluded methane, (*b*) gain by surface oxidation, (*c*) loss by escape of hydrocarbons formed by the partial decomposition of the coal.

Stages *a* and *b* occupy more or less time, according to the exact state and nature of the coal; but spontaneous combustion rapidly follows on stage *c*.

3. A loss of calorific power and a deterioration of lighting and caking values follow the escape of gases from the coal. If the carbon content of the latter is low and the atmospheric temperature is high, this loss of gas is rapid and may easily exceed 30 per cent. during one month's exposure.

The losses referred to above under paragraph 2 have been closely investigated by Parr and Barker of the University of Illinois, and the results of this investigation have been gathered and published in Bulletin No. 32 of the Engineering Experimental Station of that university. The escape of methane (CH_4) or "marsh gas" was found to be very active for the first few days after the coal was removed from the ground, but the amount liberated diminished rapidly after 48 hours, and at the end of the second month there was very little escape of this gas from the coal. The activity of the coal for oxygen, on the contrary, was found to be of much longer duration.

The Effect of Oxygen Absorption

In closing their report, Parr and Barker state that these facts have a bearing upon the subject of weathering and indirectly upon the matter of spontaneous combustion. The absorption of oxygen is undoubtedly closely associated with both of these phenomena. The conclusions drawn from their studies upon the weathering process coincide with the results of their studies on the gases occluded by coal; namely, that this low type of oxidation extends over an indefinite length of time. Under normal conditions a slight oxidation and loss of fuel values is effected, but when the conditions are favorable—as, for example, upon an increase of temperature—a rapid combination with oxygen may be brought about, leading up to what is known as spontaneous combustion.

How far this absorption of oxygen is a chemical reaction or low combustion, resulting in the production of CO_2 and H_2O, and how far it is an absorption into the molecular structure and composition of the coal, must be left, they state, for further study.

In an earlier bulletin (No. 17) published by the same university, Parr and Hamilton give the results of an investigation of the phenomena associated with the weathering of coal, the class of coal mined in Illinois being specially dealt with. The following is a summary of their observations and conclusions:

The object of the research was to test the effects of (1) outdoor exposure, (2) exposure to a dry atmosphere at a somewhat elevated temperature, (3) moisture at the same elevated temperature, (4) immersion in ordinary water at a temperature of approximately 70 deg. F. Nine lots of coal were put through these tests. The samples were analyzed and their calorific values determined at the beginning of the test and again after 5, 7 and 9 months' exposure. The first evidence of the tests was the noticeable effect of submerging the coal—the values found for the submerged coal throughout the 9 months hardly varied at all by greater amounts than might be found from two tests made on succeeding days by the same operator.

Exposure to Weather

This result may be compared with the effect of exposure to the weather which was carried out by placing the samples in shallow boxes on the flat roof of a building, where they were left from October until the succeeding July. The various samples of coal showed different tendencies to crumble, and it was found that the loss which took place varied from 2 to 10 per cent.

The loss takes place most rapidly during the first months of weathering. This contains a hint that when old supplies are on hand it may be better to allow them to stand and to use the new supply, and in this way save the loss which would occur in the latter during the first few months of weathering.

The results obtained from the samples of coal exposed to a thoroughly dry, warm atmosphere are striking, for these samples lost about as much as did those exposed to outdoor conditions. This result seems to indicate that the effect of moisture is slight, and hence the amount of protection which would be secured by putting the coal stored under cover is of little value. There was a loss due directly to the moisture if the coal contains sulphur, but this was so small that it was negligible when compared with the more serious loss of volatile hydrocarbons. In other words, weathering is not a leaching process, but seems to be a direct loss of the volatile components.

The results of this preliminary study plainly indicated the value of storing the Illinois coals under water and that it was not worth while to put them under cover when storage under water was impracticable. If large supplies of these coals are on hand, the older stocks have prac-

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tically reached a stable condition and will not deteriorate further, or at any rate slowly. It is the new supplies that suffer from the process.[1]

The action of air and oxygen upon coal has also been studied by H. C. Porter and O. C. Ralston, and their results are published in a Bureau of Mines technical paper, No. 65, of 1914.

As a result of their investigations they have come to the conclusion that there is no indication that a uniform complex is produced from different coals by oxidation. It is more probable that in each coal several different complexes are formed, the same ones occurring possibly in all coals, but in different proportions. In one coal, the complex may break up more rapidly than in another and may produce a larger proportion of water or CO_2. In general, however, oxidation at temperatures below 200 deg. C. tends both to fix oxygen and to form products in which water predominates, whereas above that temperature there is little or no fixation of oxygen, and CO_2 begins to predominate in the products.

An easily ignited coal begins to produce CO_2 in large proportion at lower temperatures than coal that is more difficult to ignite. Carbon monoxide was found to be a primary product of the oxidation of coal at temperatures between 100 deg. and 300 deg. and possibly also outside of this range.

Pyrites Not the Chief Cause of Heating

The production of water by oxidation of coal at 100 deg. or lower is of interest in connection with the devising of methods for accurate moisture determination in coal, while the direct production of carbon monoxide at moderate temperatures is of interest in connection with mining operations and the storage of coal.

The teaching of all these observations is that the internal heating and spontaneous combustion of coal are due to the action of the oxygen of the air upon the various constituents of the coal complex and that the older view, which found expression in the report of the British Royal Commission of 1875, that pyrites is the chief cause of heating, was wrong.

The conditions which tend to prevent heating are therefore (1) either the complete absence of air or (2) very thorough ventilation which prevents any undue rise of temperature in the heap of coal. These conditions are most difficult to obtain in closed bunkers filled with small coal or slack, and it is for this reason that so many cases of spontaneous combustion occur in ship cargoes of coal.

The following summary of the conditions which favor spontaneous combustion, taken from a paper read by Professor Threlfall, F.R.S., before the Birmingham, England, section of the Society of Chemical Industry, may be found of interest and value. Professor Threlfall's paper related chiefly to the heating of ship's bunker coal, but the conditions which he enumerates apply to the heating and firing of coal on land.

1. Size of Cargo or Stock Heap—The larger and deeper the cargo or stock heap, the greater the risk of heating and combustion.

2. Presence of Dust—The collection of dust that forms where the coal is tipped is the danger point in the cargo or stock heap.

3. Ventilation—Slight ventilation is more dangerous than none at all.

[1]"Electrical Review," Mar. 7, 1908.

4. Temperature—Coal loaded or stocked in summer is more liable to heat and fire than coal loaded or stocked in winter.

5. Breakage—Systems of loading or stocking coal which lead to breakage of the larger lumps are likely to contribute to the dangers of heating and firing.

As regards the stock heaps of coal stored on land or in the overhead store bins of large power supply stations, the conditions which prevent heating are more easily obtainable; and in the next article descriptions will be given of modern systems of storing coal with a minimum loss of its calorific value.

Arthur C. La Monte

All the mines of the Delaware, Lackawanna & Western Railroad Co. were idle Tuesday, Jan. 18, as a tribute to the late Arthur C. La Monte, general manager of the coal mining department. The funeral services were held at the First Presbyterian Church, Scranton, Penn.

Mr. La Monte, who was 46 years old, had been with the company since 1888. He rose from a minor position in the mine engineering corps to be its head, and succeeded Col. R. A. Phillips as general manager only a few weeks ago. Mr. La Monte spent Thursday, Jan. 13, in the mines. Early Friday morning he suffered a paralytic stroke, and the end came Sunday at 10:15 p.m.

A. C. LA MONTE
Late General Manager of the D., L. & W. R.R. Co.'s coal mines

The following incident will show what kind of man was lost when death took Arthur C. La Monte: Some years ago, while Mr. La Monte still held the position of engineer of mines, there occurred the death of a watchman who worked for the railroad department. The man left a wife and seven or eight children; and they were poor, for the wages of a watchman are not large. Some one of the men, talking with Mr. La Monte, was wondering if there was any way to let the family have coal at employees' rates. It seemed that there was not. But

Mr. La Monte held out a $5 bill, with the request that it be used for the benefit of the family. He did not know them, had never known the man who died and was not connected with the department in which he had worked; but La Monte was a big man—kindly, helpful, more than honest. We think that the Lackawanna must be glad that his promotion came before his death.

He was justly popular with his subordinates and the officers of the company. He was president for 20 years of the Railroad Y. M. C. A., an elder in the First Presbyterian Church and a leader in Sunday school work. He was past president of the Engineers Society of Northeastern Pennsylvania and a member of the Peter Williamson Lodge, No. 323, of the Masonic Order, and of the Modern Woodmen of America. His widow and one son survive him.

In the death of Mr. La Monte, the Lackawanna has lost one of its most faithful employees and the anthracite industry one of its most accomplished engineers.

The Reason

There's a miner dead and another in jail
With the mark of Cain on his brow;
It's the same old ugly and brutal tale
Of a horrible drunken row;
For they'd both be back at their job today
With the rest of the working crews,
Soberly earning their miner's pay,
If it wasn't for booze.

Bill Smith is only a drunken shine,
A sodden and blear-eyed tramp,
Yet he once knew more of the way to mine
Than anyone else in camp;
And he might be boss of a mine or so
And getting a foreman's dues,
Instead of a moocher, vag and "bo,"
If it wasn't for booze.

Jim Jones came back from a drinking spell,
And his head was dull and hot,
And so it happened he failed to tell
Of the hole he hadn't shot;
There is one man blinded and two men dead
Because he forgot that news,
Yet they'd all be living and well instead,
If it wasn't for booze.

If it wasn't for booze, why the wives who sigh
Might smile in their joy and peace,
And the sound of the children's hunger-cry
Would dwindle and fade and cease;
We'd have less dirt and rags and more
Of clothing and food and shoes,
We'd earn more pay and we'd mine more ore,
If it wasn't for booze.

—Berton Braley, in "Engineering and Mining Journal."

WHY NOT GET THE BROOM BUSY EARLY IN THE YEAR?

Editorials

Employers' Associations

One of the many reports of the Federal Industrial Relations Commission contained numerous reasonable suggestions regarding the relations between capital and labor. It was written by Prof. John R. Commons, of the University of Wisconsin, and signed by Commissioners Harriman, Aishton, Ballard and Weinstock. It is not the intention here to enter into a review of the Commons report, but only to consider the following remarks he makes about associations of employers:

> The public needs protection against the abuses of labor unions as it does against the abuses of trusts. The employers' association stands between organized labor and the public just as the railroad and public-utility commissions and the trade commission stand between merchants' or manufacturers' associations and the unorganized public. But the employers' associations are a better protection to the public against the abuses of unions than are the courts. Labor leaders who wish to keep discipline in their unions and the observance of joint agreements realize that they cannot do so unless confronted by a strong employers' association. They realize that continued abuses lead eventually to the destruction of their unions. An employer who stays out of his organization is as culpable as a laborer who stays out of his union. Employers should organize 100 per cent., just as the unions endeavor to reach that mark.

There is a great deal that is true in the foregoing remarks and they show a real sense of the value of operators' associations in regulating wages for the benefit of the public and in controlling unions for the good of the men themselves—services for which they have received only abuse and condemnation. They have performed the service of regulating wages, however, not because it is their nature to undertake it, for under different conditions they might lay down the burden and conspire with the employee against the interests of the public.

Consequently it is not at all clear that such associations of employers will be in the future devoid of all harm or that the public will let them continue divorced of all legal restraint. It has always been more or less of a surprise to some economists that the employers, when associated, are usually so strongly opposed to increases in wage scales. When in an industry the organization of employers is so complete that the increases in wage scale can be made uniform throughout and where the industry is without competition from other industries and does not suffer as the coal trade in a measure does by the sales of oil, gas, and water power, in such cases the employer has largely only two economic reasons for keeping down wages and they are not really adequate to make him furnish a stout resistance. One reason is that the wage roll will be increased and consequently more money will have to be invested in the business, and the other that the employees will make more and in some industries where discipline is lax this will make the men less disposed to work every day and so will lower the output.

The first reason operates against those who are less able financially. Those who are well supplied with funds would just as soon put more money in the business and would be in no way distressed at seeing weaker competitors removed and still weaker would-be competitors prevented by higher capitalization demands from entering the business. Consequently the leading employers would naturally favor an increase in wage rather than oppose it, provided that the increase is general throughout the industry, that there would be no loss in trade and that increases in price could be made without public clamor.

The second reason, that high wages lower output, is also not a good cause for opposing wage increases from the point of view of the employer's profit, though reasonable enough from the standpoint of efficiency. Low output results in high prices, and the employer is apt to profit more than lose by the general disorganization of the industry resultant on higher wages. So again it will be seen that the argument is in favor of an increased wage scale rather than one that is lower, provided that the public will not be driven to unfriendly legislative action by the increase in prices naturally consequent thereon.

Seeing, then, that raises in wages are not hurtful to a business in which the employers are well organized, what is there to induce such an association to abstain from giving way immediately to every demand of its employees and to prevent it from raising wages unreasonably and in such a manner as to put an unfair tax on the consumer? Obviously, advances in the price of the product of the association would follow such increases in wages whether the confederation of manufacturers was for purposes of fixing prices or merely for regulating wages.

There is nothing to prevent one body of workingmen in such a completely organized industry, therefore, from laying on other workingmen burdens that it is not right that they should bear. This will hardly happen in the coal business, for the 100 per cent. complete organization of coal operators for wage regulation is far from secured, and even if it were formed, there are perhaps still too many competing industries to make any doubling of the price of the product, for instance, a matter to be resisted for fear of oil, gas and water-power competition.

This would be accompanied in remote districts by the use of more wood and by the mining of coal by farmers where coal of any kind is to be found. Moreover, a rise in price would be a signal to jobbers and users to enter the business even if such a rise was entirely offset by a wage-scale increase. The price is usually the consideration with these impetuous persons and not the elements leading up to its determination. In other more recondite businesses a rise in price is not so generally followed by an invasion from outside capital.

Clearly then, there is a danger of skyrocketing the labor wage on a product when there is a tight union of labor and capital. No longer deadlocking, they may combine forces against the ultimate consumer and without any attempt *per se* to corner the product and control prices, they may place such prices at a wholly inequitable figure.

This might eventually be done in many industries and make the man who is not in an organized industry a pariah without the means of livelihood and without anyone to befriend him. It might further raise wages in this country by periodical boosts to a wholly undesirable

figure. We are all paying wages, one to another, and if wages get too high here, we can do no business abroad and we shall have to keep out foreign products, not so much because they are made by pauper labor but because they are made by workingmen who can buy their subsistence at a much lower rate than we can, who have to pay high nominal wages for those who produce it.

Thus the associations of operators and other employers may at any time refuse to keep wages from soaring. They may decline to bear burdens which the public is laying on them but has for years jeered at them for carrying. No wonder Mr. Bent and Mr. Peabody refused any longer to bear such a load in Illinois even though, in a large degree owing to the disorganization of coal mining, the results fell not wholly on the consumer, but on both the public and the producer.

Wage by Ton and by Hour

When *Coal Age* boldly published on Nov. 20 the editorial entitled "Paying Mine Workers Both for Time and for Output," it expected criticism, and in fact thought it had a clear understanding of the line it would take. When the thought contained in the editorial was broached at the West Virginia Coal Mining Institute, part of the anticipated criticism appeared. J. C. McKinley, Josiah Keely and Joseph Virgin presented the arguments against the concept with force and ability; the only criticisms they did not advance were the difficulties in determining just what the time and output wage should be and in persuading mine workers and operators that a change was desirable.

Reasonable criticism is natural enough, and no statement can be formulated, let alone that which was made in the editorial, which cannot be partly met by a clever disputant. But the argument advanced seemed so baldly plain that the remarks of A. M. Iner in our issue of Jan. 8 appear utterly unfathomable, especially seeing that he declares he has read and studied the article several times in order to "comprehend the reasons for the conclusions and to understand the premises on which they are based."

Now there is no need to answer Mr. Iner; the simpler plan is to tell the story of inefficiency in a plainer way than ever before. And so this editorial goes unsparingly to its task.

Output wages in industry generally are not a recent introduction. It rather appears that the proportion of day labor has increased. Formerly much work was taken home and done for a recompense, based not on the hour, but on the piece. But the home industry soon failed when larger tools came into use, and system broke up a trade into a number of divisions, each part needing men of a peculiar skill or at least devoted to a certain definite process in the whole work. The idea of going from an output toward a day wage is not new and revolutionary. It follows a not unusual course; only it does not follow it to its end.

Let it be considered for the sake of argument that in the early development of the coal industry it had been customary to pay the tipplemen for unloading a car by the ton or the car. A dime would have been a low compensation for this service if the car held a ton, for the work was done with a shovel or by hand, the end gate being immovably fixed. But probably a dime would have been the price placed on the work. Even today cars are unloaded in this way the length of the coal fields at the smaller farmers' coal banks.

Now let us assume that 10c. would have been the price if the box of the car had a raised drawbar or was flat, if there were bolts in the car or the bottom was smooth. Why contrive a better shoveling base if the workman demanded his dime anyway? Still more, why remodel all one's cars and add end gates and an easily arranged latch if it profited no one but the miner? Many owners would have said such improvements only add to the weight of the car and the cost.

And yet more, we may say, why put in a horn dump and a Phillips crossover? Such changes make necessary a heavier and larger tipple, add to the complications and cost money. The miner gets his dime in any event. Let him expend his muscular effort and earn his money even though a good price for dumping coal under modern conditions is between ¼c. and ½c. a ton, and less yet with a self-dumping cage.

All these improvements would never have been introduced had the dime charge per ton acted as a dampener to industry. We would have rested content with the shovel and the strong hands and arms of the mine worker. But because day labor did the work we cut out the difficulties and introduced the machinery. Instead of being indifferent to the toil and needless motions of the workmen, we tried our best to eliminate them, for we paid inevitably for them all. Every burden we lightened from the back of the unloader raised a load from our purses. As a result car lifts came into general use, and the only inefficiency now is in the irregularity with which the cars are delivered for dumping and in the delays which occur in the placing of railroad cars under the tipple. We are doing our best to remedy these difficulties, and in well-arranged plants they are largely eliminated; but they would not have been, nor would those obstacles which are more mechanical, had the operator not had a direct interest in providing for their removal.

It is enough at this time to say that the miner working by the ton has largely placed himself outside the pale of the interest of the operator. Most mine owners, hard pressed by competition, can do little or nothing out of pure philanthropy. Some enlightened managers, where the coal is not sold or where union wages are not paid and competition is not fierce, are trying to help the miner make a large tonnage on account of their interest in his welfare; because if he does well he becomes a better satisfied and more loyal workman and because a large tonnage from a given area reduces haulage costs and lowers the expense development. But it is absurd to say that these ends would press the operator on to the same extent as he would be urged if there were income derivable from the promotion of these humanitarian ends. The argument is conclusive enough, though there is a great deal to be said in favor of the idea that it is easier to propose paying both by the ton and by day than it is to put the plan into effectual operation.

President John White of the miners' union says: "I will make strenuous efforts to avert an anthracite strike. The operators need not lose a day if they will meet fairly the miners' demands for an eight-hour day, recognition of the union, the check-off, increased wage scale," etc. Just think how the operators have worried when all the time such a simple remedy was at hand.

Sociological Department

Mine Workers' Welfare in 1915

SYNOPSIS—Review of the past year's activities in mine workers' welfare. Wherever the companies are making money, welfare work is provided, and in some of the plants impoverished by excessive competition the miners in their unions are collaborating with the companies in first-aid and other work.

The leading change of the past year in sociological work has been the participation of the union. In a more or less half-hearted and passive way that organization has in the past approved of first aid, but now the attitude is quite active, especially in those districts where there are small companies lacking the size and finances to plan large movements and hold big first-aid meets.

The delay in the movement was never wholly to be ascribed to indifference or opposition. It rather arose from the provincialism of the miner. He has been slow to learn about the progress of first aid. He cannot travel from community to community nor from state to state. Nor have his papers given him adequate information on the work being done. There was a restraint in making public the good work directed by operators; just as there would be a certain chariness on the part of operators to follow the lead of the union.

So some of the miners in distant villages learned about first aid late, usually in the main through the American Red Cross and the United States Bureau of Mines. And very avidly did they receive the instruction. They could not wait for the annual meetings, but found various excuses for holding more contests, as if they could not get too much of a good thing.

Coöperative Stores Progress in Illinois

And another point in the year's welfare is the progress of the coöperative store. It is to be hoped that this does not mean that the miner gets his goods without providing some one with a profit, because profits are a benediction to the workingman. Rather it is desirable that the miner make a dividend for himself by such coöperative action and better yet that he succeed in making savings that will enable him to take care of his declining years, the education of his children and the building of a small fortune and a home.

The Peoria *Labor News* tells us that the Gillespie Cooperative Society in the town of Gillespie, Ill., moved a year ago to quarters three times as large as it occupied when it started. Today these quarters are crowded to

MR. ROCKEFELLER, MANAGER WEITZEL AND OTHER C. F. AND I. OFFICIALS MEETING REPRESENTATIVES OF THEIR EMPLOYEES

AT SOME PENNSYLVANIA MINES "COMMUNITY" DAY BRINGS OUT THE ENTIRE POPULATION

TWO PENNSYLVANIA MINERS DRESSED FOR A "FOLK" DANCE

their fullest capacity, and if the society could again move into quarters three times as large as those it is now occupying, it would have no more room than it needs. It is trying to purchase additional ground to erect new buildings.

In Springfield, Ill., a coöperative is only just being financed, but at Sesser, the coöperative society has done business for a year, and a quarterly dividend of 5 per cent. on the basis of purchases has been declared, and in addition a 5 per cent. dividend has been apportioned to those who paid for their $5 and $10 books in advance. It has $695.81 in its treasury, which could have been paid in dividends, but is held to increase the capital stock. Six per cent. interest has further been paid on all share and loan capital.

The Royalton (Ill.) Coöperative Society has paid 12½ per cent. during the life of the store, which is over a year, the total sales reaching $8,584.51. The dividends paid to members were $1,084.31. Further, 6 per cent. has been paid on all share and loan capital. The Livingston, Ill., coöperative endeavor is quite young, the first quarter having just been passed. The dividend on purchases is 7 per cent.

The Farmington (Ill.) Coöperative Society shows a gross profit of $424.42. The Staunton, Ill., society, which is run on the Belgian rather than on the Rochdale, England, principle, proclaims that it has reduced prices in competitive stores and shows a profit of $252.22 for the quarter. The society has just built a $9,000 building for the warehousing of perishable material.

Miners at Beckemyer, Eldorado, and Breese in Illinois, have just started coöperative stores, all three being managed by one society and having about $2,000 in share capital and 100 members for each place. The Mount Olive No. 15 mine was closed seven days after the starting of the coöperative store at Mt. Olive, Ill. The mine was idle for 8 months, and as about 95 per cent. of the men were working in that mine and as the store is still doing business, some regard this as evidence that coöperative societies will weather the storms of slack work.

A meeting was held at Johnson City, at which practically every coöperative store was represented. An association was formed, and steps were taken to enable the societies to do their purchasing as a unit. William C. Sharpe is the coöperative auditor for District 12 of the United Mine Workers of America (comprising all Illinois), and he is furnishing information and encouragement to the movement. In Ohio also much interest has been shown in the coöperative principle of store management.

The value of thrift is being taught in mining villages by the Young Men's Christian Association wherever that

JOHN D. ROCKEFELLER, JR., FRATERNIZING WITH EMPLOYEES OF THE COLORADO FUEL AND IRON CO.

body has branches, and mine-village banks are growing steadily more numerous.

The Colorado Fuel Co., after having done all manner of sociological work in the past, is now preparing to do even more. However, success is predictable only if water is more abundantly provided. Much of the West is so repelling to the Easterner that it is hard to secure the right kind of labor. It is certain, however, that John D. Rockefeller, Jr., has created a new sentiment in Colorado by his trip to that state. It is interesting to note that the impression left by him on his trip to the Fairmont region in the State of West Virginia was equally favorable. The characterization of Rockefeller by one old loafer at Fairmont, a striking exemplar of the never-to-be-reconciled classes, is too forcible to be given here, though spicily detailed along the upper reaches of the Monongahela River. He certainly made friends with everyone in his short trip over the properties of the Consolidation Coal Co. in Monongahela, Harrison and Marion Counties.

How Temperance Spreads in the Mining States

The coming year will find many more coal fields under prohibition laws. While some regret the temperance legislation in West Virginia, there are many who believe it makes for peace and efficiency and renders the state a better place for operation. In the anthracite regions the operators have induced the saloon keepers to limit their opening hours, and the work of Billy Sunday, the evangelist, for a long time made the neighborhood of Wilkes-Barre, Penn., more temperate.

On Feb. 6 Arkansas passed a prohibition law. On Feb. 18 the Iowa House of Representatives voted to reëstablish prohibition on Jan. 1, 1916, and on Mar. 6 Governor Clarke of Iowa signed a constitutional amendment establishing prohibition, but this provision will need a second passage through the legislature. On Feb. 20 the Montana Senate accepted the state-wide prohibition bill submitted to it by the House of Representatives. This bill provided for submitting the question to a referendum instead of arranging for an amendment to the constitution.

On Feb. 25 the Idaho Senate passed a state-wide prohibition bill which the House had previously adopted. It was signed on Mar. 2 by Governor Alexander and became effective Jan. 1. Though Idaho is hardly a coal-mining state, its action will have a wide influence in the West. On the same day the Utah House adopted a state-wide prohibition law which had been previously passed by the Senate, but on Mar. 18 Governor Spry vetoed this bill on the ground that the Legislature was pledged to submit the question to the voters and that the amended local-option law provided a means of establishing prohibition if the voters so desired.

It is clear that prohibition has made large gains in the West, especially where there are mining camps. It is customary to look upon the West as a home of insobriety and irresponsibility, but the men in charge of the mines can well deny that they can be any longer so stigmatized, and they are determined to bring their men into line. The fingernails of the West are fast becoming manicured, and in a few years it may give the East a lesson in sobriety. Colorado became "dry" on the first of the year, and the Colorado Fuel and Iron Co., desiring to avoid a drunken close to 1915, put the law in effect in advance in the many mining and other villages under its control.

Welfare Work of the Lehigh Valley Coal Co.

General Manager Chase, of the Lehigh Valley Coal Co., has recently announced plans for welfare work among the employees of the company which go far beyond anything heretofore attempted in the anthracite district. While these are founded upon the provisions of the compensation law, they do much more for employees than that legislation contemplates. The law requires that in case of injury the employer must furnish, if necessary, during the first two weeks, medical attendance to the value of $25 and also surgical aid to the value of $50. If inability to work continues beyond the two weeks, the employee is to be compensated for his loss of time.

Naturally, in order to protect themselves the operators are providing medical examination for employees, for it would be reckless to employ a man already affected by some disability, because the same disability might later be attributed to strains or injuries incurred during work for the employer. Most of the companies decided not to examine those who were in their employ before the law went into effect, but to make a careful examination of all men thereafter employed, while some decided to examine all employees. Thus it has become necessary for the operators to employ a more or less extensive corps of physicians.

Will Give Medical Care for Indefinite Time

It will be seen that the law provides for medical attendance and surgical work, if necessary, during the two weeks immediately following the injury, at the end of which time the injured man, if he is still unable to work, is to be paid a certain compensation for loss of all time after the first two weeks. But if a man is unable to work at the end of the fortnight, it is quite probable that he needs more attention from a physician. Yet at the end of two weeks of idleness there is likely to be little money to pay for the services of a professional man, and in all probability the needed attention will not be given.

There is the further possibility that after having had the attendance of the company physician for two weeks, at the end of that time the family will wish to change physicians if they have the funds. In fact, considering the smoldering distrust of all actions of the employer which is found in so many cases, it may be considered quite probable that a change in physicians will occur at the end of the two weeks of free attendance by the company physician. In all probability the change will be disadvantageous, for the physician engaged by the coal company is sure to be a competent man.

The Lehigh Valley Coal Co. will not only follow the mandates of the law but, whole-heartedly accepting its provisions, will do more than is required. Instead of merely furnishing the required medical care for two weeks, it will take charge of every case with the purpose of putting the injured man into condition to resume work in the shortest possible time. To do this there will be one company physician, or more if necessary, in each community in which the company has important workings. These physicians will give every case the necessary attention, no matter how much longer than the prescribed two weeks this may be needed.

In order that the work of curing the men may progress to the best advantage, one or more trained nurses will be

stationed in each community. They will give the necessary attention at the time of the injury and will also instruct the family of the injured man, so that he may have the best care which the circumstances permit.

NURSES TO PLAY IMPORTANT PART

These nurses will also look after cases of illness among employees and their families, so that some trained attention at least may be given to all, even though no physician is employed. It is the hope of General Manager Chase that in time these nurses will so far gain the confidence of the members of the communities which they serve that they may aid in improving the conditions in the home and in raising the standard of living. They are expected to help keep the communities clean and to aid in teaching those under their care how to make the best use of their resources.

The undertaking is a large one, and the finer details must be worked out as the necessities develop. The company has operations in six counties. There are 34 important mine openings and 23 breakers. The number of employees is about 20,000, so that counting five persons in the family for each employee, the company is planning to look after the health of about 100,000 persons. According to the present plans, about $50,000 per year will be spent in the work, all of which will be in charge of Dr. S. P. Mengel, a physician of high rank in Wilkes-Barre. The first-aid work will be conducted by this new department, and the first-aid men will hold meetings with the physicians and nurses for the discussion of methods and results.

Union First-Aid Exhibition

A state-wide first-aid demonstration was given by 28 teams of Iowa miners at the Coliseum, Des Moines, Iowa, on Dec. 18 under the auspices of the Greater Des Moines committee of the Chamber of Commerce, the East Des Moines Commercial League, the Trades and Labor Assembly, the Des Moines Manufacturers' Association, the Allied Industries of Des Moines and the United States Bureau of Mines.

The demonstrations were under the direction of W. D. Ryan, mine safety commissioner, and J. J. Forbes, of the United States Bureau of Mines. No awards were made, and no time records were kept, the meet being educational and not competitive. All members of the Des Moines police force who could be spared from duty were in attendance with their chief.

The miners were not informed what problem they were to solve until three minutes before time was called for a start. Problems were divided into three classes for solution by one man, two men or by all six of the men in a team.

One man was selected from each team to represent the injured person, and the captains of the teams selected their representatives for the one-man and two-man events. The problem was announced by the judges, the team being allowed three minutes in which to prepare its work and then given a definite time within which to complete it.

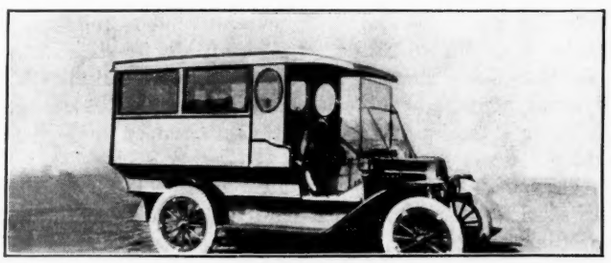
The first problem was to remove a man with a broken back from a mine in such a manner as to prevent further injury. Other problems had to do with asphyxiation, fractures, burns, electric shock, lacerations and all kinds of other injuries.

Des Moines had six teams entered in the demonstration. Carney sent three teams—one composed of Americans, one of negroes and one of Italians. Buxton, Mystic and Scandia sent two teams each. Others came from Hocking, Hiteman, Seevers, Boone, Zook, Spur, Ogden, Oralabor, Knoxville, Seymour, Foster, Chariton and Tipperary.

Mayor Hanna welcomed the visiting teams and commended the purpose of the demonstration. W. H. Rogers, president of the 13th district of the United Mine Workers of America, said the demonstration was the beginning of a concerted campaign to reduce accidents in Iowa mines and manufacturing plants.

Automobile Ambulance

The G. B. Markle Co. has found a good use for the Ford automobile in addition to the common ones. It has taken off the ordinary body and put on an ambulance body. This has two longitudinal seats. On the right side it has a hinged extension which can be raised up and supported on folding legs. When the cushion is removed, this gives a support for a litter. This side of the body



G. B. MARKLE CO.'S LIGHT AMBULANCE

extends in front over the space commonly occupied by the front seat, so that there is plenty of room for the litter, while room remains for the driver on the left side.

The car is provided with a storage battery, and the interior is lighted by an electric bulb placed in the middle of the top. The horn is operated by a foot lever, and an electric gong is operated from the front seat by a push button. The outside is painted a pleasing gray and trimmed in black. The appearance is very much less grim and depressing than that of the ordinary black ambulance.

Old Age Pensions Are Possible

The enactment of the workmen's compensation law will make old age pensions inevitable in Pennsylvania it is thought. This pension system, it is predicted, will be inaugurated within 10 years, when the public will have realized that that means is the cheapest and most honorable manner of caring for those aged men and women who must certainly be thrown out of work when the compensation act is enforced.

In and around the coal mines of the state a great many old men are employed, and when the new law goes into effect, these old men will be considered "bad risks" and will be discharged. The state will find that it is as economical to pension an aged worker direct as to support him in a county institution and much more desirable.

In some sections of the mining region, trouble is beginning to brew, as some miners are refusing to answer a number of questions submitted to them by the operators, and which the workers say are clearly designed to enable the operators to single out these "bad risks."

Discussion by Readers

Efficient Mine Foremen

Letter No. 21—I have read with a great deal of interest the numerous letters on this subject and had recently come to the conclusion that the ground had been so well covered that there was nothing left to say, till I read Letter No. 15, Jan. 1, p. 24, by a Pennsylvania foreman.

This correspondent says that the "mine foreman who hides 'gas' or other dangers found in the mine from the inspector is the one who stands the best chance of holding his place and drawing the highest pay." In most cases this was probably true 20 or 25 years ago; but I believe it is only so today in a small minority of instances, except in individual operations where the owner's knowledge of the physical condition of his property is gained largely from the state inspector's report; and as long as that is satisfactory, he thinks his mine is all right. But in that case the foreman is fooling both the state inspector and his employer.

The larger, more progressive and uptodate coal operators today are not only endeavoring to comply with all the requirements of the state laws and state mine inspectors, but are going further and employing their own inspectors, whose requirements are even more rigid than those of the state, and are enforcing safety rules that are more stringent and exacting than the state mining laws, for they realize that true economy and efficiency follow the same lines as greater safety.

What Constitutes Efficiency in a Foreman

Briefly expressed, my opinion of what constitutes an efficient mine foreman is that he is one who can produce a maximum tonnage of clean, marketable coal of maximum quality at a minimum cost, with due consideration for the safety and welfare of the men in his employ and the safety, proper ventilation and maintenance of the mine in his charge. He must be fair, impartial and honest in all his dealings with everyone.

I do not agree, however, with Oliver Young, Letter No. 12, Nov. 27, p. 898, that an efficient mine foreman must be experienced in every branch and department of coal-mining work, for the reason that while he is getting experience in some branches, he can be absorbing knowledge of the others.

The answer to the question asked by a reader in Letter No. 14, Dec. 25, p. 1073, as to how the fireboss is to make a second examination of every working place during working hours if he has to give proper instructions to the men on his rounds, is that he will have to hustle, and if the territory is too large for one man to cover, additional firebosses must be employed. Edward H. Coxe.

Knoxville, Tenn.

Letter No. 22—This discussion has interested me very much, and I want to say that in my opinion a mine foreman to be efficient must be a man of superior knowledge and executive ability. While he must practice economy, he must not be "penny wise and pound foolish." Taking the word "foreman" in its literal sense, it describes one who is a fore man—one that will say, "Come, boys," in such a way that men will be glad to follow his direction and the work will go forward with a hearty will.

It must be recognized that all good workmen have minds of their own and do not relish being "bossed" by a man who makes this feature his most prominent characteristic. Men do not need to be bossed so much as to be made acquainted with the details of the work to be done. A foreman who gives his instructions in plain, simple language will get more and better work out of men then the boss who gives his orders in a commanding tone, designed to impress on the workmen the importance of his position.

To illustrate my meaning, let me cite an incident that occurred the other evening. Our mine foreman came to me just before quitting time and said, "I would like to have you come back tonight." I told him I would and asked what I was to do. He replied that I was to help Bill ——, one of his assistants. On my reporting for work after supper, Bill said to me, "Get some oil." I got the oil. He said nothing by which I would know what I could do to help him with the work, but his orders were always, "Get this," or, "Get that," until our work was done. The next day he remarked to the foreman what a "blockhead" I was, saying that I "did nothing, but had to be told everything that had to be done."

In my own defense I might say that had Bill taken five minutes to explain what he wanted to do, I could have anticipated his wants and had the necessary tools and material at hand ready for his use. However, I received some consolation when two days later I was directed by the foreman to do the work over again by myself.

A good foreman is a valuable man to the company that employs him, but a "boss" should never be hired.

——, Penn. Helper.

Gaining a Maximum Tonnage

Letter No. 2—One of the most important features in relation to gaining a maximum tonnage, discussed in Letter No. 1, *Coal Age*, Nov. 6, p. 771, is the need of replacing the old method of pick mining with the more efficient and uptodate method of undercutting coal with machines, or as we say, machine mining.

A few years back it was an uncommon thing to see other than the laborious method of drawing coke by hand, which required a large number of men for that purpose. When men became scarce, the necessity of a more rapid method of performing this work increased, and the result was the adoption of machines for this purpose. When these machines were first introduced, prejudice was so strong that it was some time before they could be regarded as successful, but with the growing scarcity of men, their adoption became a necessity, and it was soon found that the coke could be drawn as well by machine as with the hand and much cheaper.

It may be asked, What has the use of machines for drawing coke to do with the matter of gaining a maximum tonnage in the output of coal from mines? I would answer that much the same prejudice exists in regard to the general adoption of machines for undercutting the coal as existed with respect to the use of mechanical means for drawing coke. The growing scarcity of pick miners, however, naturally compels the adoption of mining machines by many whose prejudice would not otherwise permit their use. In every case where machines have been installed in mines under favorable conditions, the advantage gained by the change has been clearly proved by the increased tonnage and reduced cost of production per ton of coal mined.

Heretofore the general plan in mining coal has been to open out a large area, and mine operators were not satisfied unless they had many acres of developed coal, much of which was left to stand and await the time when it could be worked to advantage. The large area of workings thus exposed increased the cost of ventilation, drainage, timbering and supervision; but without this large area the growing demand for coal could not be satisfied with certainty.

Concentration of Mine Work Needed

It is generally recognized today that mine workings must be concentrated and confined to as small an area as the required output of the mine will permit. This concentration of work could never be effected under the old plan of employing the large number of pick miners necessary to produce the required tonnage. The answer to this concentration of mining is "mining machines." It has been found that an area that would produce 100 mine cars of pick coal would furnish 300 cars of machine-mined coal.

No argument is needed to prove to the practical miner that such a concentration of work in the mine and decrease of area developed mean a large decrease in operating expense, but this is not all. Machine coal can be produced cheaper than pick coal, just as machine coke is cheaper than coke drawn by hand. Prejudice in regard to the use of mining machines is fast disappearing, and machine mines are generally considered more advanced and productive of a larger tonnage at a lower cost of production per ton of coal mined than mines where only pick miners are employed. It must be recognized that the tendency in every industry is to employ mechanical means to supply the growing demand for every product at a reduced cost. The men required to operate and superintend these machines must be possessed of greater intelligence and skill, but the work is performed with less muscular exertion and effort.

———, Penn. SUPERINTENDENT.

Mine Discipline Imperative

Letter No. 3—In his letter No. 2, *Coal Age*, Nov. 20, p. 855, Carson W. Smith takes the view that, by reason of the change that has taken place in the methods employed in enforcing obedience, "there is better discipline in the mines today" than ever before. I agree with him fully in this view for the following reasons:

In the operation of all industries, we are living in an age when greater economy and better systems are practiced. If coal mines and factories were to be operated today with no better systems than formerly, they would in most cases prove failures. The systems and methods of mining have changed from what they were in the "good old days." Men do not think or work in the same way. Old methods have been exchanged for new and better ones, and as more mining knowledge has been acquired, our conception of discipline and the methods of enforcing it has also changed. Enforcing discipline by imposing fines and penalties has been exchanged for the better and more successful plan of getting in closer touch with the worker and appealing to his common sense, reason and judgment.

There are more men employed in the mines today than ever before. More mining machinery is used, and more system and efficiency required in the operation and management of the mine. More men are trained in safety-first and first-aid work, and more miners read mining journals. As a result, mine workers are better informed in regard to the importance of discipline and the disastrous results that are likely to follow acts of disobedience. Officials and miners are, in general, in closer touch and understand one another better now than formerly. As a natural consequence, a better mine discipline is maintained.

The demand of operators for more efficient mine officials has to a considerable extent developed greater efficiency on the part of the miners, and it follows that the more intelligent and proficient miners become the less reckless and indifferent they will be to the mine rules and regulations; just as the more ignorant and illiterate they are the less they regard all laws, rules and regulations designed for their own protection. They are prone to regard all such requirements as so many oppressions forced upon them and favoring those above them. They consider, in a way, that they have a right to violate any rules if they can do so without being found out and punished for it, and they act regardless of the consequences that may follow. To the extent that mining conditions have been greatly improved by efficient management—to that extent has the miner become more observing and thoughtful in the practice of discipline.

Effect of Liquor on Mine Discipline

The use of liquor has been given as a reason for lack of discipline in mines. It is very true that the use of liquor in or about the mines by both officials and miners has a strong tendency to induce a disregard for all regulations and is destructive of mine discipline. But observation and inquiry convince me there is not so much liquor used now by miners as in the so-called "good old days," and consequently discipline and system should be correspondingly better now, and I believe this is the case.

There might be a question as to whether what was formerly considered "discipline" was really discipline after all. To compel persons to do certain things, even for their own safety and protection, is not discipline in the true sense of the term. Discipline really means the art of thinking and planning for one's own government and direction. The right kind of discipline is attained by training the miner to feel his share of the responsibility in the success and welfare of the operation. In fact the best form of discipline and the kind that will prove most beneficial and effectual in the end is to train every mine worker how to detect dangerous conditions.

If the making of a charge of powder with a lighted lamp on the head is an act of disobedience and shows a lack of discipline, as it surely does, then more than half the

miners who worked in the same mine with me 30 years ago and who followed this practice were not disciplined. Nothing was thought or said in regard to the practice being dangerous. Out of the 175 men employed in that same mine today, I venture to say that but few if any could be found who would act so foolishly. Discipline in that respect, then, has been much improved.

Early Method of Maintaining Discipline

In the earlier days of mining when discipline was taught by force and peremptory demands, it was the boss who was feared and not the result of a disobedient act. Under the present system of effecting and maintaining discipline, it is not so much the boss that the average miner fears as the disastrous results his act may bring upon himself, and his fellows. Miners fall into the habit of doing things without previous thought. To educate these men to form the habit of thinking before acting is to impress on them the importance of their own safety and the danger that is likely to occur to others as the result of their careless acts. If miners could be impressed with the fact that the neglect of today in many instances is responsible for the disasters of tomorrow, they would begin to have a broader view of their personal responsibility.

It seems to me that there are at times too many rules and regulations posted in and about coal mines for them to be effective. A multiplicity of rules and regulations are often disregarded and do not make for discipline. When I was a boy attending the public schools, I remember that during the first few days the teachers would read a long code of rules that would chill the average boy's blood. But these rules were never enforced and were soon forgotten. At the last school I attended the teacher had only one short rule, which was: "All boys must do right every day of the school." This rule was not forgotten by the boys and was rigidly enforced by the teacher. Much better discipline was maintained by this one rule strictly enforced than by the large number of other rules that were not observed. The responsibility of thinking before acting was placed upon each boy, and he felt its importance.

John Rose,
Dayton, Tenn. Former District Mine Inspector.

Letter No. 4—The question of maintaining strict discipline in mines is one of the greatest importance in relation to the safety-first movement, which employees in every industry should do all in their power to promote. My observation leads me to conclude that many who constantly preach safety first are the very ones who give it least heed in their daily practice. While they realize its importance, they are apparently unmindful of its application to themselves and their own acts.

It is not uncommon to hear a mine foreman, assistant foreman or fireboss remark in regard to a man working under dangerous conditions, "Let him go ahead. I have warned him, and if he gets killed, I am not responsible, as I have done my duty." A foreman or other mine official who will take such a stand is not fulfilling the duties of his position, though he may be sufficiently hardened to such conditions that his conscience will rest easy while he knows a man is in danger.

The duty of every mine official is to see as far as lies in his power that every man performs his work in a safe manner. If a man is inclined to risk his own life through lack of knowledge of the dangers surrounding him, after he has been warned of those dangers, lay him off for a few days until he is willing to use more caution and protect himself from possible injury or death. If he fails to learn the lesson of taking needed precautions after a little more teaching, discharge him, as it is much better to do this than to have the man killed when in your charge. On the other hand, if an experienced miner who has or should have a general knowledge of the dangers that surround him is found working in danger of which he is or should be conscious, he should be discharged at once for such an offense.

I have known of a number of instances of deplorable neglect or carelessness on the part of mine foremen. I call to mind one case in particular where a large number of men were injured by accidents of continual occurrence, not a few of these men being killed. In each case our superintendent would apparently be much exercised and read the men a lecture on safety first. He would exclaim, "Safety first, boys, safety first! These accidents must stop. We must not continue to cripple men in this manner." As a matter of fact, however, the conditions in that mine were shameful. Many a time I have walked the entry with a safety lamp that gave little light and, while watching my steps, would strike a low trolley wire. At another time in reaching for a door handle, my ear would come in contact with a 0000 feed wire that was unprotected.

Unsafe Conditions Invite Accidents

As I reflect on the conditions in that mine, I wonder that more men were not killed and a larger number injured, as the same unsafe conditions existed throughout the entire workings. There was not the lawful clearance at the side of the haulage road, but men were compelled to cross between the cars at different places where a more or less straight track would swing from side to side of a crooked entry. The law required 2½ ft. of clear level space on one side of the road, and there was hardly this room on either side. Besides the danger from unprotected wires and clearance at the side of the cars, there was much danger from gas in working places, insufficient timbering and loose rock resting on timbers on the main-haulage motor road. In fact you could find danger whichever way you looked in that mine, which proves what I have said that it is not always the mine where the biggest safety-first cry is heard that has the highest regard for this motto in daily operation.

I have been assistant foreman in our mine almost a year, and with the help of Providence and good careful firebosses, I am thankful to say that we have had but one man slightly injured and no person severely hurt or killed during that time. On several occasions I think I have been just in time to prevent accidents from falls of roof. I have severely reprimanded men in a number of instances and in four cases sent them out of the mine for neglecting to make themselves safe from ordinary dangers. There are, it is true, some unforeseen dangers that it is difficult to guard against, but these are few in comparison with those due to the neglect of persons to use ordinary precautions to protect themselves. I want to urge on all mine officials the necessity of making every man in their charge realize that he is responsible not only for his own safety, but for that of his fellow workers. Let every endeavor be made to instruct all mine workers in regard to the necessary care and caution to be taken

in the performance of their work. If a man appears to be intractable, harsher measures must be used with him in order that mine accidents may be reduced.

Permit me to draw attention to the many little matters with which practical men are well acquainted, but which are so often neglected. These are the safeguarding or protecting of live wires. Men should understand that an unprotected wire presents a worse condition than no wire at all as far as safety of operation is concerned. Another important point is to permit no loose rock or slate to rest on timbers on a haulage road. Although the timber supporting the rock may be five or six feet from the cars, they are likely to be knocked out by a derailed car, and a serious or fatal accident may result. Also, see that the clearance of 2½ ft. required by law is maintained on all haulage roads and continued throughout on one side of the entry. A new driver, taking it for granted that this is the case, is exposed to accident if that requirement has not been fulfilled. Again, keep all shelter holes clear of obstruction, which seems an unnecessary reminder, but it often happens that a shelter hole is temporarily blocked with dirt that is to be loaded out at night. It is well, also, that all switch levers should be on one side of the road and all doors open from the same side of a haulage road so far as this is practicable. A difference in this regard may cost a man his life when he tries to push open the door from the wrong end and finds too late that it opens from the other. These matters all bear on the question of mine discipline.

Meadowlands, Penn. DANIEL MCKAY.

Letter No. 5—In order that a mine foreman shall be able to maintain strict discipline in the management of the mine in his charge, it is important that he be not only a man possessed of executive ability, but also be well informed in regard to the technical questions relating to the work in hand. As I have remarked in a previous letter, he must be a student of modern methods, which knowledge can be gained only by constant reading, study and personal observation. In my opinion the safety and discipline of a mine are only to be attained through such qualifications, which give to the foremen the power to instruct men in a forceful and effective manner.

FRANK DISCUSSION AN ADVANTAGE

It is remarkable how few mine officials are willing to discuss with the men in their charge the most effective and practical means of performing certain work that they are expected to do. It would seem that foremen often fear such a proceeding would lower their dignity and prestige. That theory is wrong, however, and wholly unworthy of a competent foreman, assistant foreman or any official whose duty it is to visit a man's working place and give him advice and instruction. A simple order or instruction with reference to the work a miner must perform is often ineffectual for the reason that the miner does not comprehend its meaning and importance, which as a workman he should be made to understand. This can best be done by the foreman getting the miner's viewpoint in reference to undercutting coal, boring and charging holes, firing shots, setting timbers, etc. With this knowledge in hand his instructions and orders will be more effectually obeyed.

If a foreman finds a man who has a disposition to disobey orders or neglect instructions, using in preference his own ideas and methods, the discipline of the mine demands that he should dismiss such a man from his service. In this way only can the foreman promote discipline and eliminate accidents for which the law holds him responsible. The same is true concerning all mine employees. Unless they submit willingly to the discipline of the mine, they endanger not only their own lives and that of their fellows, but the property of the company that employs them. This thought should be so impressed on all mine workers that they will come to regard it as a matter of deep concern.

INSTRUCTIONS NEEDED IN ALL MINE WORK

Discipline in the mine requires that roadmen shall be carefully instructed in the methods of laying and maintaining good track and roadbeds. They must be made to realize that they are held responsible for all wrecks or delays because of poor track, defective rail joints or switches, and other matters affecting safe haulage. The life of a trip-runner is often in the hands of trackmen. The foreman is responsible for the capability of the trackmen he employs. Before permitting them to serve in that capacity, he should question them carefully on the subjects of grade, mine curves, track gage, weight of rails and amount of elevation required in outer rail of curve, details of switches, etc.

Trip-runners should likewise be questioned by the foreman to ascertain their knowledge of the mining law relating to the running of trips. They should be instructed to report promptly any defective tracks and cautioned with reference to their use until repaired. Trip-runners and motormen should possess some knowledge of the laws of mechanics relating to the inertia of bodies, so as to be acquainted with the difficulty of starting a body at rest and bringing to rest a body in motion. They should understand the safe speed limit for curves and should be thoroughly acquainted, together with their helpers, with the signal system and signs employed in the movement of cars. Careful instructions should be given these men in respect to safe methods of coupling cars.

Timbermen employed in mines should be made to realize that a vast amount of responsibility rests upon them and that many accidents can be avoided by the use of proper judgment and care in the performance of their work. They should be cautioned to set timber on haulage roads in such a manner that it cannot be easily dislodged by a derailed car or a broken axle. Good judgment must also be exercised in regard to the selection of timber. A good timberman should be able to compute roughly the strength of materials and know approximately the load they must support. The foremen should be able to outline certain safe rules and methods that are applicable to all timber work in mines, such as the jointing of timbers, wedging of collars and providing for possible side pressure on the timber sets.

I anticipate that the question may be asked, Do coal-mining companies need such obedient, careful and well-informed employees as I have described? I answer positively, Yes. I want to add that the man who loves his home and works in accordance with the principle of safety first is the truest type of workman. He regards the company's interest as his own. As the number of such men employed in the mine increases, the work of the first-aid team will be proportionately less.

Hooversville, Penn. PHILIP M. WEIGLE.

Inquiries of General Interest

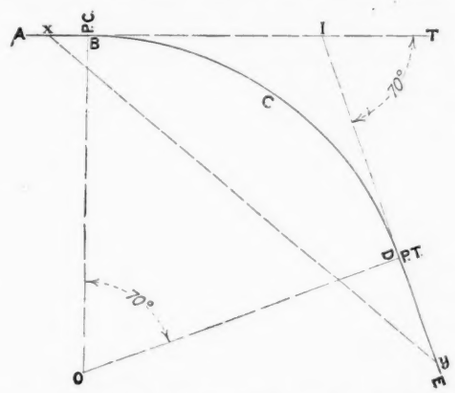
Calculating Railroad Curves

I would like to ask for a clear explanation of the general practice in railroad surveying for determining the degree of curve connecting two tangents. I have several works on surveying, but none of them makes the subject quite clear to me. One author says in regard to curves: "In railroad surveying, curves are known by the number of degrees that an arc of 100 feet subtends at the center. Thus, if 100 feet subtends 2 deg. at the center, it is called a 2-deg. curve." In some way this statement does not seem reasonable to me, as I would be inclined to make this a 4-deg. curve. I believe this question and other similar ones that occur so frequently in surveying practice will be of great interest to readers of *Coal Age*, as the work of the mine surveyor or engineer is not wholly underground. STUDENT.

Hanna City, Ill.

The statement quoted by this correspondent is practically correct, the degree of curve being designated by the angle at the center subtended by a chord of 100 ft., since the measurement is made on the chord and not on the arc. However, in general railroad practice, the difference is slight, as the length of a 100-ft. chord corresponds practically to that of the arc it subtends, except in very sharp curves.

In the accompanying figure the curvature is exaggerated in order to show more clearly the relation of the curve



TRACK CURVE CONNECTING TWO TANGENTS

to its chord and tangents. The curve *BCD* connects the tangents *AB* and *DE*. The point *B* where the curve starts is called the "point of curve" and is marked *PC*. The point where the curve ends is called the "point of tangency" and is marked *PT*. It frequently happens in fieldwork that the two tangents to be connected by a curve cannot be run out to their intersection, which, if possible, would greatly simplify the problem of locating the *PC* and *PT* points for any desired curve.

This makes an interesting problem in surveying, as it requires some ingenuity on the part of the engineer or surveyor to determine the location of these points quickly and accurately. A traverse is first run between any two fixed points *x* and *y* on the tangents, and the length and direction of the line *xy* calculated. This determines the total angle of curvature, which is equal to the angle *DIT*, or the angle between the tangents at their point of intersection *I*. Assuming the point *I* is inaccessible, let some of our engineers or surveyors explain their method of locating the *PC* and *PT* points on the respective tangents. Taking the angle of intersection of the tangents as $I = 70$ deg. and the length of the line *xy* calculated from the traverse connecting the tangents as 1,275 ft., let it be required to lay in a 7-deg. curve connecting these tangents.

In other words, knowing the angle *DIT* and the length of the line *xy*, calculate the length of the radius of a 7-deg curve and find the distances *xB* and *yD*, which will locate the *PC* and *PT* points of the curve. The simplest and shortest method will be published in answer to this inquiry.

Power To Operate Fan

Kindly answer the following question: A mine fan operated as a blower is delivering 50,000 cu.ft. of air per minute under a water gage of ½ in. in the fan drift. If the outside doors admitting air to the fan are closed so as to reduce the quantity of air passing to 30,000 cu.ft. per min., will it require a greater or less power of the motor to drive the fan at the same speed?

Rock Springs, Wyo. READER.

The plan of closing the outside doors of the fan for the purpose of reducing the quantity of air passing from 50,000 to 30,000 cu.ft. per min. would be a poor one to adopt. The proper way would be to reduce the speed of the fan. This would require only about 53 per cent. of the original speed, which would mean practically the same reduction of power.

If, however, the outside doors admitting air to the fan are closed and the quantity of air passing is thereby reduced in the above proportion, the effect is the same as would result in lengthening the airways. By thus restricting the intake, the fan is virtually exhausting on one hand while blowing air into the mine on the other. In effect a less quantity of air is passing under a higher gage, which means a greater efficiency in the fan; and for the same power applied to the fan shaft the speed of the fan will be increased.

Therefore, to maintain the same speed in the fan a less power of the motor will be required when the intake doors are closed. We estimate that practically it will require five-eighths of the original power to maintain the same speed of the fan when the quantity of air passing is reduced in the given proportion by the means mentioned, as compared with slightly more than one-half of the original power to produce the desired reduction of the air volume by slowing the fan.

Examination Questions

Miscellaneous Questions

(*Answered by Request*)

Ques.—The airways in a mine are 7x12 ft. in section, and the water gage at the ventilating fan is 1½ in. If the static pressure at this mine is equal to 1 in. of water gage, what quantity of air is passing?

Ans.—The reading of this question is not intelligible, as it is not clear what is meant by the "static pressure." If it is assumed that this static pressure is an air column opposing the general circulation of air in the mine and that the effective water gage producing the circulation is therefore 1.5 — 1 = ½ in., it would then be necessary to know the length of the airways in order to determine the quantity of air in circulation under such effective water gage. Without knowing this length or the entire rubbing surface of the airways, from which the so-called "equivalent orifice" of the mine or the mine potential can be calculated, it is impossible to estimate the volume of air in circulation. The question cannot be answered, therefore, because of insufficient data being given.

Ques.—In the event of the ventilating fan at a mine breaking down when there is no duplicate fan, what would you do to restore the ventilation in order to get the men out of the mine?

Ans.—The difficulty and danger would be greater in case this is a gaseous mine. In such a mine there should always be provided a duplicate fan that can be brought into action in such an emergency. There being no duplicate fan in this case and assuming that no gas is present, a fire-basket can be lowered down the upcast shaft, which will produce a sufficient air column in a fairly deep shaft to greatly assist in maintaining the ventilating current in the mine, to an extent that will enable the men to reach the surface in safety.

Advantage should always be taken of any surface wind, which may be deflected into the mouth of the downcast shaft or the intake slope or drift. This can be done by erecting a sail or canvas at the mouth of this shaft. In some cases it may be practicable to assist the ventilating current by diverting a stream of water into the downcast shaft. These last two means may be applied in case the mine is generating gas where it would be dangerous to use a fire-basket in the upcast.

Ques.—How would you work a 9-ft. seam of coal with 3 ft. of bad rock above it, over which there is a good sandrock, so as to afford the miners the greatest amount of safety?

Ans.—Drive all entries and rooms in the lower bench of coal, taking out, say, 6 ft. of coal in the entries and 5 ft. of coal in the rooms, leaving the rest of the coal as a roof in the first working. This coal should be well timbered and can be taken down when coming back on the pillars. Extra care will be required in drawing back the pillars.

Ques.—Given 10,000 cu.ft. of air passing per minute through an airway 8x10 ft. in section, under a pressure of 13 lb. per sq.ft., estimate the length of this airway.

Ans.—The perimeter and sectional area of this airway are as follows: $o = 2\ (8 + 10) = 36$ ft.; $a = 8 \times 10. = 80$ sq.ft. The velocity of the air is

$$v = \frac{Q}{a} = \frac{10{,}000}{80} = 125\ ft.\ per\ min.$$

Now, writing the formula for the unit pressure in terms of the velocity and transposing this formula to find the length of the airway, we have

$$p = \frac{klov^2}{a};\ \text{and}\ l = \frac{pa}{kov^2}$$

Hence, substituting the given values in this formula, we have for the length of this airway

$$l = \frac{13 \times 80}{0.00000002 \times 36 \times 125^2} = 92{,}400\ ft.$$

Ques.—There is circulating through an entry a current of 3,000 cu.ft. per min., which is a firedamp mixture at its most explosive point and assumed to contain 9.38 per cent. of gas. What additional quantity of fresh air must be added to reduce this current to a 1-per cent. mixture?

Ans.—The volume of gas in the original current assumed to contain 9.38 per cent. of gas is 3,000x0.0938 = 281.4 cu.ft. per min. If this gas is 1 per cent. of the current after adding fresh air, the total volume of that current will be 281.4 ÷ 0.01 = 28,140 cu.ft. per min. This is a mixture of gas and air and contains all the gas and air in the original current. Hence, the volume of air that must be added to produce this condition is 28,140 — 3,000 = 25,140 cu.ft. per min.

Ques.—(a) What are the legal qualifications and duties of a fireboss as defined by the law of West Virginia? (b) Should he possess other qualifications than those required by law?

Ans.—(a) The qualifications and duties of a fireboss required by the mining law of West Virginia (1915) are given in sec. 28-62 inclusive of the law. Copies of the mining law can be obtained from E. A. Henry, chief of the Department of Mines, Charleston, W. Va., and should be in the hands of every mining man.

(b) Besides the knowledge and experience required by law, every fireboss should be thoroughly acquainted with the mine in his charge. He should be conscientious in the performance of his work, alert and closely observant of all conditions affecting his examination of the mine, fearless of danger and strictly honest in his report, which should describe briefly but clearly any dangers or unsafe conditions he may have observed when making his examination.

Ques.—(a) What, in your opinion, is a miner's first duty on entering his working place in the morning? (b) Who should have preceded him there by law?

Ans.—(a) The first duty of the miner on entering his place is to examine the roof carefully and look for the fireboss's mark indicating that he has examined the place that morning and found it safe for work.

(b) The fireboss should have made his early morning examination.

Coal and Coke News

Harrisburg, Penn.

Important action, regarding questions which have arisen in workmen's compensation matters concerning determination of wages were threshed out this week at a conference of compensation and insurance officials. The suggestions will be considered by the board later.

At the conference were Messrs. Leech and Scott, of the state board, F. W. Nece, of the Globe Indemnity Co., New York; H. S. Recknagle, of the Fidelity and Caualty Co., New York; C. M. Herhood of the Pennsylvania Manufacturing Casualty Insurance Association, Philadelphia; Thomas L. Phillips, of the United States Fidelity and Guarantee Co.; Francis H. Bohlen, legal adviser to the compensation board; E. H. Downey, consulting actuary; Samuel L. Spyker, associate counsel, and Lee Solomon, secretary to the compensation board.

It was decided that the computed wages of an employee shall not include gratuities received from the employer or others. This action eliminates tips received by a waiter or porter from his wages, on which compensation is based.

Wages paid for overtime work in seasonal occupations will be included in the wage determination. Tools or other materials furnished by the employer to be used by the employee may not be deducted from wages unless it is provided in the contract of employment that the employer shall furnish them.

In coal mining, where an amount is paid for each ton of coal mined, the employer is not allowed to make deductions for powder or dynamite supplied workmen unless it is so provided in the contract of employment.

A seasonal employment is defined as one periodically suspended for periods of more than four weeks because of conditions in a trade or industry. In seasonable trades the employee must show the total amount he has earned in all trades for the preceding year. A referee may require the employee to verify such statement by word of his employers.

Daily wages of an employee is assumed as his average daily earnings during the six months preceding the accident or during the length of time he has worked for the same employer. In the event of objections to this assumption in a continuous employment, the average daily earnings are computed from the total earnings for 26 weeks and dividing the aggregate amount by the actual number of days during which the employee worked for the same employer, excluding overtime.

Weekly earnings are 5½ times the daily earnings. Weekly earning of an employee hired on a monthly basis are obtained by multiplying the monthly salary by 12 and dividing by 52.

Compensation for a fractional part of a week is determined per day by one-sixth of the weekly compensation for every day, including Sundays and holidays.

Among those announced as exempt from the insurance features of the law are: Lehigh Valley Coal Co., Wilkes-Barre & North Penn Coal Co. of Pittsburgh.

A Question for the Supreme Court

The question of whether plaintiffs in this state can institute suit for damages against coal companies of the state in the Supreme Court of New York is pending in the Pennsylvania Supreme Court, and several cases in which injunctions have been granted will remain as at present until the Supreme Court decides.

Within the last few months several lawsuits, claims of widows for damages for the death of husbands killed in the mines, were filed in the Supreme Court of New York City. The coal companies filed equity suits in the lower courts to restrain these actions, claiming that the trial of lawsuits in New York City would be unjust and unfair to them, entailing extra expense and depriving them of the right to compel the attendance of witnesses.

Preliminary injunctions were granted and on an appeal of one case from Lackawanna County to the Supreme Court of this state, an agreement was filed this week that the preliminary injunction granted in the lower courts would remain in force and effect until the Supreme Court decided the question.

The pending suits affected by the agreement include: Hillside Coal and Iron Co. vs. Rozalya Susnik, Pennsylvania Coal Co. vs. Louisa Kaychinsky; Pennsylvania Coal Co. vs. Mary A. Reichel; Pennsylvania Coal Co. vs. Sofia Shalder.

The whole situation arising from the action of the Supreme Court in declaring the anthracite coal tax act of 1913 unconstitutional and refusing the petition of the Attorney General for a rehearing will be taken up by the Governor, Attorney General and Auditor General next week. The assessment of taxes under the act of 1915, which was under way, will also be taken up and the future of the matter decided upon.

Governor Brumbaugh has received acceptance of service on the commission to investigate the raise in the price of anthracite and Thomas Martindale will be chairman of the commission.

Auditor General Powell will take up with the Attorney General the question of collecting the anthracite coal taxes under the new escheat law, which, it is held, is limited in its operations to banks, under a provision in one section. It is expected at the capitol that a constitutional test of the escheat act will be made.

PENNSYLVANIA

Anthracite

Hazleton—A. Pardee & Co. has dismissed all boys between the ages of 14 and 16 years from the workings in and about the Cranberry and Crystal Ridge collieries, on account of the new labor law. As a consequence the mines are badly handicapped.

The fire that raged since early in December in one of the slopes of the Lattimer mines of the Pardee Brothers & Co. cost two lives on Jan. 13, when Conrad Hanley and Eugene Fince, members of the crew fighting the blaze, were killed by black damp. The flames are under control and it is thought that all danger has been overcome.

Mahanoy City—Mangled almost beyond recognition, Andrew Coulson, aged 49, and his son, Anthony, aged 19, were found dead on the 12th level of the North Mahanoy mine on Jan. 11, having been blown 100 ft. down a counter when a 25-lb. box of dynamite exploded. The elder Coulson is the father of 13 children. His son was a Christmas bridegroom.

Peckville—The strike at the Von Storch colliery has been amicably adjusted and the 700 men have returned to work. The strike was started because 32 of the men, it was claimed, were not paid as much wages by the company as was allowed them under the award of the Anthracite Coal Strike Commission. The company has agreed to pay in accordance with the award.

Shenandoah—Several hundred men and boys were given employment when the Plank Ridge washery resumed operations after a long idleness, taking coal from the culm banks which have been accumulating in this vicinity for many years.

Jeanesville—The Lehigh Valley Coal Co. has developed the stripping operations in this vicinity until they now produce 26,000 tons of coal daily.

Scranton—It is stated that the work of flushing the workings in the Diamond vein of the Peoples Coal Co. is to be started soon. It is said that the contractors sinking the boreholes for this purpose will finish their work within a few days. The flushing is to be done with ashes collected throughout the city and from coal company plants and power houses of other corporations.

Bituminous

Windber—Three persons were painfully burned here on Jan. 11, when the old "Red Row" of tenement houses owned by the Berwind-White Coal Mining Co. burned to the ground. The victims were a man, a woman and their small child. The origin of the fire is not known. The houses sheltered the families of seven miners.

Pittsburgh—One of the largest financial transactions that ever took place in the state occurred when the Pittsburgh Coal Co. and the Monongahela River Consolidated Coal and Coke Co. were joined as a single corporation under the title of the Pittsburgh Coal Co. of Pittsburgh. The capitalization of the merged companies is divided into $40,000,000 of preferred stock and $40,000,000 common. The new company will come into control of much of the coal land bordering on the Youghiogheny and Monongahela Rivers, a large proportion of the output of which is shipped via water to Ohio and Mississippi River points. By the consolidation of the two companies

a large expenditure in management will be saved. A committee of the board has been appointed to arrange a plan of stock adjustment and the payment of the overdue dividends. It will present its plan to the stockholders of the two companies for approval in a short time.

Fayette City—One child was killed, a man seriously injured and 14 houses destroyed, while 13 families were rendered homeless as the result of a fire recently in a row of houses owned by the Pittsburgh Coal Co. and occupied by miners. It is thought that the fire originated from the explosion of an oil lamp. A keg of powder stored in the room where the fire originated exploded, hurling the man out of the house and killing the child.

Connellsville—The production of coke in the Connellsville region for the week ending Jan. 8 was 429,968 tons. Compared with the previous week this shows a recovery of 50,190 tons. Merchant interests produced 178,674 tons and the furnace overs 251,294 tons.

Washington—Two men were seriously burned and three others injured in a recent explosion of gas at the new mine of the Washington & Connellsville Coal and Coke Co. at Coon Island near Claysville. The exact cause of the explosion has not yet been determined. Only a small pocket of gas was encountered and the material damage done was small. Work at the mine was not seriously interfered with.

WEST VIRGINIA

Moundsville—It is rumored that the owners of the Mound Mine, which recently went bankrupt, will soon be able to reassume control of the mine. Extensive improvements have been made and it is thought that negotiations may be soon concluded whereby the mine may be again placed in operation.

About 150 miners employed at the Panama Mine of the Ben Franklin Coal Co., south of Moundsville, recently went on strike, refusing to use the new electric safety lamp. Later on, however, these men resumed operations pending the decision of the state mine inspector as to the necessity of using these lamps.

Wheeling—Many of the coal mines in this section of West Virginia are unable to work full time because of the scarcity of railroad cars with which to handle the output. Full forces of men are being worked, however, all the time that it is possible to work them.

Charleston—The Supreme Court of Appeals recently heard the appeal of the widow of the late Jerome Gooding, a miner employed by the Davis Coal and Coke Co. at Henry, W. Va., from the decision of Lee Ott, compensation commissioner, denying her a pension under the Compensation Act. The mine in which Gooding was employed, although all of the openings and the offices of the company are in West Virginia, extends to the Maryland side of the state line. It was in these workings that Gooding was killed and his widow is now denied compensation on the ground that he was killed outside of the state.

ALABAMA

Maxine—The first of the 12 barges being built by the Pratt Consolidated Coal Co. for use on the Warrior River, recently arrived at Maxine and was immediately loaded with coal for Mobile. It is expected that another barge will soon be delivered for this work. The De Bardeleben Coal Co. has made arrangements for another boat which will give it two in service between Cordova and Mobile. The Alabama & New Orleans Transportation Co. is handling the output of the Tennessee Coal, Iron and Railroad Co. from Taylor's Bluff and weekly trips are being made. The river traffic in coal is increasing rapidly and it is expected that a large amount of coal will be handled this year by this route. Traffic up stream is being sought, but so far only a small amount of freight has come up beyond Tuscaloosa.

KENTUCKY

Barbourville—An extension of the Black Mountain & Wasioto R.R. from Benham, Harlan County, Ky., through to Virginia, is said to be a probability of the near future, surveying crews having been working on the route. At Benham is located the big plant of the Wisconsin Steel Co., with a large battery of coke ovens now in full blast and mining operations working overtime. Southwestern Kentucky coal operators are complaining of a shortage of miners.

Frankfort—The usual crop of measures directed at the coal interests of the state are beginning to appear at this session of the Legislature. The workmen's compensation bill, which is acceptable in its present form to the operators, has already been introduced, while other bills are being drawn or have been laid before one or the other house. One bill introduced related to the method of weighing coal at the mines. Another provided for licensing of coal operators.

OHIO

Glouster—Business men of this vicinity and other towns in the coal field are making an effort to get the Sunday Creek Coal Co. to resume operations at its mines. A party of those interested went to Columbus a few days ago to secure the coöperation of members of the Public Utilities Commission and officers of the company. John S. Jones, one of the principal stockholders of the company, stated that as soon as freight rates and the wage scale were adjusted the company's Ohio mines would resume operations.

Columbus—It is stated by leaders of the coal miners that a 10% increase in wages for both pick and machine mined coal on a run-of-mine basis will be demanded by the miners Apr. 1. This will make the rate for machine mining 51.7c. per ton instead of 47c.

Martins Ferry—An attempt to destroy by incendiary fire the coal tipple at the Florence Mine, owned by the Youghiogheny & Ohio Coal Co. recently, was frustrated by the vigilance of the night watchman. The fire obtained a good start before being discovered, but by hard work the watchman succeeded in preventing its spread. Minor difficulties between the management and miners is thought to have been responsible for this attempt at incendiarism. Steps have been taken to have the affair thoroughly investigated.

Flushing—The Black Oak Mine, formerly owned and operated by the St. Clair Coal Co., of Cleveland, has resumed work under the name of the Dillon No. 5, now owned by the M. A. Hanna Coal Co. It is reported that it will cost $25,000 to put this mine in the same condition in which it was before the recent coal strike.

ILLINOIS

O'Fallon—The Prairie mine, 2 mi. west of here on the East St. Louis & Suburban Electric Ry., resumed operations Jan. 14, after having been closed down since Mar. 31, 1914. The mine is owned by the Aid Coal Co. of St. Louis. It was closed down because the conditions of the market did not favor profitable operation. Officers of the company say the prospects are good for steady operation, although the company has no contracts now, and will be on the open market. About 300 miners are employed.

Edwardsville—All the coal operators in the Edwardsville district advanced the prices of all grades of coal 25c. a ton Jan. 15. Notice of the advance was given a few days before.

Belleville—E. H. Smiley, receiver of the Taylor Coal Co., has leased the Taylor mine near O'Fallon to the Yoch Coal Co., which operates a mine at Carbon. About 100 men will be employed at the Taylor mine.

Troy—Passenger service is to be inaugurated in about a month on the St. Louis, Troy & Eastern R.R., owned by the Donk Bros. Coal and Coke Co. Combination passenger and freight trains are to be operated between Troy and Maryville, where they will connect with interurban cars. Later the trains may be operated all the way to St. Louis. A large section of the Madison County coal field will be accommodated by the service.

Maryville—Six hundred miners employed at Donk Bros. Mine No. 2 recently had to climb a ladder 300 ft. high to get home after a cable in the shaft had broken. The cable broke when a cage loaded with coal was being raised to the surface. No one was injured, but the mine was closed for repairs.

Johnston City—The Williamson County Coal Co. has appointed William Ruff, of Collinsville, as superintendent of its mine here to succeed Mayor Harry Barlow, who recently resigned after 21 years of continuous service. Mr. Ruff, who has been connected with the mines of the Donk Bros. Coal and Coke Co., has had many years experience and is familiar with all departments of mine work.

IOWA

Albia—In reaching for a wisp of hay on the side of a car at Hocking mine No. 4, a mule a few days ago started in motion with its nose other cars loaded with explosives. In the explosion which resulted John Waters, driver, was injured, perhaps fatally. Three ribs were fractured, he was burned about the face, badly bruised and inhaled poisonous gases. Nine mules were killed, but this number did not include the originator of the trouble. The cars were at the top of an incline. The iron gate leading to the opening of the shaft was not closed and the powder cars toppled over, falling to the lowered cage.

Eldora—Renewed interest has been manifested in the coal production of Hardin County. Recent prospecting has shown an excellent field of coal near Eldora. Several hundred acres have already been proven which will mean the development of a large coal mine soon. Further prospecting

s expected to result in the finding of other valuable coal fields.

Chariton—The Central Iowa Fuel Co. is mining about 1,000 tons of coal per day near Chariton. The influx of miners has boosted the population of Chariton 37% since 1912, the biggest increase in the state with the exception of one other town.

PERSONALS

Ray Moss, of the Moss Coal Co., has taken charge of the Pucketts Creek Coal Co., Burchfield, Ky., as superintendent.

H. R. Bissell has changed his position from superintendent of the Century Coal Co. to superintendent of the Preston Coal Co., of Independence, W. Va.

Louis F. Lumaghi, president of the Lumaghi Coal Co., St. Louis, has been elected a member of the Board of Directors of the Central National Bank of St. Louis.

M. G. Blair, a prominent coal operator and banker of Tuscaloosa, Ala., has been appointed by the Governor of that state as a member of the Mobile Port Commission.

U. U. Carr, formerly associated with the Monongahela River Consolidated Coal and Coke Co., and later with the New River Co., has now become associated with the Diamond Machine Co., of Monongahela, Penn., as general manager.

Rees H. Beddow, state mine inspector for New Mexico, has tendered his resignation to take effect Feb. 1, 1916. Mr. Beddow has devoted 40 years' service to the coal mining industry, but in the future he will be engaged in farming and fruit raising in Florida.

Clarence N. Orr, recently appointed a district deputy mine inspector for the first district of West Virginia, has resigned his position and accepted the superintendency of a large mine in Utah. He will be succeeded as inspector in the first district by George R. Cook.

G. M. Gillette, manager of the Kentucky Division of the Consolidated Coal Co., recently made a trip to Marquette, Mich., to see the Halby shoveling machine in operation, and to the operations of the Solvay Collieries Co. at Kingston, W. Va., to see the Oldroyd mining machine at work, with a view of possibly using these machines at his operations on account of the prevailing shortage of labor in the Kentucky coal fields.

W. H. Soper, of Des Moines, Ia., Western sales manager for the Kentucky Jewell Coal Co. and the East Tennessee Coal Co., after spending the holidays at Jacksonville, Fla., has returned home, stopping on the way at Knoxville, Tenn., and Chicago, Ill. Mr. Soper is organizing a company to develop a coal mining lease on the Lesher Estate in McDowell County, West Virginia, on the Norfolk & Western R.R., in the Sewell or Davy-Pocahontas seam of coal.

The following officers were elected at the annual meeting of the Central West Virginia Coal Operators' Association on Jan. 11: President, C. K. Jenkins, Fairmont; first vice-president, A. Lisle White, Clarksburg; second vice-president, R. B. Isner, Clarksburg; treasurer, C. J. Ryan, Clarksburg; secretary, D. R. Lawson, Fairmont; directors, A. Lisle White, Dan Howard, V. E. Gocke, A. C. Leisering, J. B. Hanford, W. A. Calloway, C. D. Robinson, R. M. Hile, J. A. Clark, J. M. Wolfe, W. E. Watson, Jr., Brooks Fleming, Jr., R. B. Isner and M. L. Hutcheson.

OBITUARY

Carles Cooke Scaife, president of the William B. Scaife & Sons Co., Pittsburgh, died recently at his home in that city, aged 72 years. Mr. Scaife was a native of Pittsburgh, and was identified with the business for over 50 years.

George A. Bergen, coal traffic manager of the Erie R.R., died recently from the grippe. Mr. Bergen had been connected with the coal traffic department of the Erie 27 years. He lived at Rockville Centre, L. I., where the funeral took place.

Charles H. Burnett, one of the earliest coal operators in the State of Washington, recently died in Seattle at the age of 68 years. Mr. Burnett was a native of Providence, R. I. He came to Washington in 1857, and in 1863 moved to Seattle, where he formed the partnership of Stone & Burnett, and engaged in a general merchandise business until 1884, when he became interested in the coal mining industry. In 1904 Mr. Burnett disposed of all his coal mining interests to the Pacific Coast Coal Co., since which time he has been actively engaged in business.

TRADE CATALOGS

Templeton Kenly Co., Ltd., Chicago, Toronto, London. "Simplex Jacks." Illustrated, 24 pp., 6x9 in.

Renfrow Coalette Machine Co., St. Louis, Mo. "Renfrow-Coalette Press." Illustrated, 24 pp., 8x10 in.

H. Edsil Barr, Erie, Penn. "The Barr Pneumatic Light Forging Hammer." Illustrated, 4 pp., 6x9 in.

The International Filter Co., Chicago, Ill. "International Water Softener." Illustrated, 8 pp., 8½x11 in.

The Erie Trailer Mfg. Co., 12th & Liberty St., Erie, Penn. "Trailers and Jitneys." Illustrated 22 pp., 9½x6 in.

Kerr Turbine Co., Wellsville, N. Y. Bulletin No. 54. "Economy Turbo-Generators." Illustrated, 32 pp., 6x9 in.

International Filter Co., Chicago, Ill. "Mechanical Filters, Vertical Pressure Type." Illustrated, 14 pp., 9x6 in.

American Mining Tool Co., Ottumwa, Iowa. Catalog. "Drills, Picks, Lamps, Etc." Illustrated, 60 pp., 7x10 in.

American Pulverizer Co., E. St. Louis, Mo. Catalog No. 21. "Pulverizers, Air Separators." Illustrated, 12 pp., 2½x9 in.

The International Filter Co., Chicago, Ill. "The International Filter for Purer Water." Illustrated, 15 pp., 9x6 in.

De Laval Steam Turbine Co., Trenton, N. J. Catalog F. "Centrifugal Blowers and Compressors." Illustrated, 64 pp., 6x9 in.

Alberger Pump and Condenser Co., 140 Cedar St., New York. Bulletin No. 20. "Hammond Water Meters." Illustrated, 24 pp., 6x9 in.

The Globe Iron Roofing & Corrugating Co., Cincinnati, Ohio. Catalog H. "Sheet Metal Building Materials." Illustrated, 166 pp., 6x9 in.

A. D. Granger Co., 90 West St, New York. Bulletin No. 2. Oswego Internally Fired Water Tube Boilers." Illustrated, 16 pp., 8x10½-in.

Edison Storage Battery Co., Orange, N. J. Bulletin No. 1125. "Edison Storage Batteries and Some of Their Applications." Illustrated, 24 pp., 6x9 in.

Sweet's Steel Co., Williamsport, Penn. Catalog. "Light and Heavy Steel Tee Rails, Angle Bars, Standard A. S. C. E. Sections, Etc." Illustrated, 10x12 in.

Hauck Mfg. Co., 140 Livingston St., Brooklyn, N. Y. Bulletin No. 60. "Application of Hauck Oil Burners and Torches in Different Shops." Illustrated, 16 pp., 6x9 in.

Link-Belt Co., 39th St. and Stewart Ave., Chicago, Ill. General Catalog No. 110. "Elevating and Conveying Machinery, Power Transmission Machinery, Crushers, Etc." Illustrated, 576 pp., 6½x9½ in.

INDUSTRIAL NEWS

Spring Hill, Iowa—New coal fields at Spring Hill, Warren County, are proving decidedly productive One hundred new houses are being erected for miners.

Buffalo, N. Y.—Following the rate on Ohio No. 8 coal through Buffalo eastward of 6c. over the Pittsburgh rate the Bessemer shippers have now obtained a rate the same as the Clearfield rate eastward.

St. Louis, Mo.—Increase of 28c. a ton on coal from Toluca, Ill., to points in Wisconsin, Iowa and Minnesota on the Chicago, Milwaukee & St. Paul, were disapproved recently by the Interstate Commerce Commission.

Baltimore, Md.—In a statement issued by the Baltimore & Ohio R.R. this company states that there are 230 separate corporations operating coal mines on the lines of the company east of the Ohio River, with a total of 383 mines.

Columbus, Ohio—The Borderland Coal Sales Co., which has offices at Roanoke, Va., and Cincinnati, has taken a lease on offices in the Columbus Savings and Trust Building for a Columbus branch which will be managed by H. W. Jenkins.

St. Louis, Mo.—The Chicago, Burlington & Quincy R.R. hauled 17,000 more loaded cars in December than in the corresponding month of the previous year, a gain of 12%, while the

increase on the Illinois Central in the same period amounted to 10 per cent.

Huntington, W. Va.—The Pocahontas-Winifrede Coal Co., which has been occupying a suite on the eighth floor of the First National Bank Bldg., has leased another suite on the seventh floor of the same building, the former quarters having proved too small.

Kansas City, Mo.—Laundry owners of Kansas City are turning to coal for fuel, with oil at $1.50 a barrel. They say that they figure coal more economical than oil at 75c. per barrel, but the price of oil has been advancing from that figure since last September.

Paducah, Ky.—The Illinois Central R.R. is storing thousands of tons of coal in its yards here, following the lead of Eastern lines, anticipating a miners' strike in April. It is denied by Illinois Central officials here, however, that they have any fears of a strike in the Kentucky coal fields.

Buffalo, N. Y.—The Ohio No. 8 coal shippers have been given an eastern rate of 8c. over the Pittsburgh rate, both rates to Buffalo being the same, $1.25. Eastern embargoes will for the present interfere much with the use of the rate, but Buffalo prices will advance as soon as it is established.

Norfolk, Va.—The British ship "Northmount," which left Newport News recently with a cargo of coal for Trinidad, foundered in a storm 100 mi. east of Cape Hatteras. The crew, consisting of the captain and 18 men, were rescued by the "Iroquois" of the Clyde Line and landed at New York City.

Huntington, W. Va.—Coal operators in the Elkhorn field of Kentucky are unable to meet the increasing demand for coal and coke. The operators at Jenkins are reported to be importing miners by the train load, and it is said that they have sufficient orders to keep the mines running for another year.

Buffalo, N. Y.—The New York Central R.R. has refused to continue the privilege to shippers of billing coal to themselves here and then rebilling to outside customers on the through rate. This enabled shippers to watch their shipments and fill orders more quickly than to bill to customers direct from the mines.

Scranton, Penn.—The American Safety Lamp and Mine Supply Co. states that it is now manufacturing complete Wolf type miners' safety lamps and is booking orders not only from the principal coal centers of the United States, but from many foreign countries and from cities supplying coal mines in all parts of the world.

Long Island City, N. Y.—The coal pockets of A. J. and J. J. McCollum, Inc., located on Newtown Creek, Long Island City, were damaged by fire to the extent of $25,000 on Jan. 17. The pockets contained about 15,000 tons of various grades of coal. Strenuous work on the part of the firemen prevented the entire plant from being destroyed.

Little Rock, Ark.—The Secretary of State recently revoked the charter of the Central Coal and Coke Co. of Kansas City to do business in Arkansas. He alleged that this firm has violated a state law which provides that a foreign corporation which is sued in the state court and transfers the case to the Federal Court shall forfeit its charter.

St. Johns, N. F.—Owing to most of the coal fleet having been purchased by the Russian Government and many of the other vessels being impressed by Great Britain the entire colony is on the verge of a coal famine, with the worst part of winter yet to come. The price for fuel has reached an exceptional figure on account of the shortage and there are no prospects of relief.

Philadelphia, Penn.—The Supreme Court sitting here recently denied the appeal of the Attorney General for a rehearing of the State's case on the coal tax law which was declared unconstitutional on Oc. 28. The suit was brought by the Aldan Coal Co. to test the act of June 27, 1913, and state officials are reported as saying that the act of 1915 will probably fall in the same manner.

Port Clinton, Penn.—As evidence of the intention to make increased use of the Schuylkill Canal for coal shipments the Philadelphia & Reading Railway Co. has commenced work on the building of a new loading wharf north of the Little Dam at Hamburg. To reach this the company is also constructing over a quarter mile of double track extending from the Port Clinton tunnel to the landing.

Connellsville, Penn.—The Colonial Trust Co. of Pittsburgh has advertised for sale on Jan. 28 the collateral deposited by the Isabella-Connellsville Coke Co. to secure the payment of its issue of 6% serial short-term collateral gold notes to the amount of $1,500,000. Default was made in the payment of both principal and interest of these notes since May 1, 1913, and the trustee is proceeding under the provisions of the collateral trust agreement.

Seattle, Wash.—Thirty-three mining men, with experience varying from one to 25 years, have enrolled in the Nineteenth Annual Three Months' Short Session of the College of Mines, University of Washington, Seattle. At the annual smoker tendered the Short Session miners by the student branch of the American Institute of Mining Engineers, Captain R. H. Stretch, of the Alaska Bureau, Seattle Chamber of Commerce, delivered an address on "The Mineral Belts of Alaska."

St. Louis, Mo.—The Illinois coal-carrying lines recently completed a three-day session before Commissioner Yates of the Public Utility Commission of Illinois in the matter of the 5c. per ton advance in coal rates from the Illinois mines to Chicago and other state destinations. An immense tonnage is involved, especially in the Chicago district. Advances in coal rates have been granted recently to East St. Louis of 5½c. by the Public Utility Commission and of 10c. from Illinois mines to territory west of the Mississippi River by the Interstate Commerce Commission.

Kansas City, Mo.—Not a wheel turned in Kansas mines Jan. 12 and 13, and only a small amount of coal was mined on Jan. 14. Resumption on the 15th was partial. The situation had been aggravated by the reduced production following the holiday season, and by numerous petty strikes in various mines, such as refusal of miners to work because of too little or too much heat in wash rooms, etc. In the Missouri fields delays were due to refusal of men to work outside, and to the equal reluctance of locomotives and machinery to operate smoothly under the unaccustomed cold.

Galveston, Texas—Contract for construction of a modern-coal-handling transfer and storage plant has been awarded by the Clinchfield Fuel Co. to M. C. Bowden, of Galveston. The improvements contracted for will cost more than $50,000, and are made by the company in order to care for its increasing business of coaling steamships at this port. It is believed that with the new plant in operation steamships will be able to obtain bunker coal here as cheaply as at any other port on the Gulf or Atlantic coasts, which they cannot do now with the antiquated means for handling coal from dock to steamer.

Harrisburg, Penn.—Acting in accordance with a legislative resolution of June 15, 1915, Governor Brumbaugh has appointed a commission to investigate the prices of anthracite coal which it was alleged were increased following the imposition of the Pennsylvania state tax on July 1, 1913. The committee consists of Thomas Martindale, a prominent retail grocery merchant of Philadelphia, ex-Judge Robt. S. Gawthrop, of West Chester, and John Langdon of Huntingdon. This commission is to serve without compensation and report to the legislature on Jan. 1, 1917. The act also appropriated $5,000 to meet the expenses of the commission.

New York N. Y.—In spite of the large accumulation of freight for export on the piers of New York, the Pennsylvania R.R. has removed practically all the restrictions on accepting for shipment freight of this kind. The restrictions which are still in force include the following: Flour, cotton, lumber, on through bills of lading for export, and hay, straw and empty barrels for domestic freight. It is said that it will be certainly necessary to impose restrictions again if shippers fail to coöperate with the railroad by offering for transportation only such freight as can be disposed of promptly upon its arrival in the New York district.

Birmingham, Ala.—Inquiries have recently been received by Birmingham coke manufacturers for large quantities of coke for shipment to Mexico. Several years ago this district shipped hundreds of thousands of tons of coke annually to Mexico, but on account of increased freight rates, cheaper water rates from other districts, and the general business depression, this business gradually diminished until there were no shipments from this district. The inquiries state that if Birmingham can supply a regular tonnage of coke for smelter purposes that a large tonnage can be used under contract by the Mexican smelters in the Sates of Sonora and Monterey.

Champaign, Ill.—The University of Illinois announces 14 research fellowships in the Engineering Experiment Station, open to graduates of American and foreign universities and technical schools. Appointments are made for two years and lead to a Master's degree. Nominations to fellowships are made from applications received by the Director of the Engineering Experiment Station; they are based on character, scholastic attainments and promise of success. The fellowships afford an excellent opportunity for the carrying on of investigations in the various branches of engineering and for the study of problems of importance to engineers and to manufacturing and industrial interests. Those desiring additional information should address the Director of the Station at the University.

Market Department

General Review

Urgent demand for anthracite, particularly at Down East points. Exports show a large increase. Transportation problem becoming more serious inland. Heavy demand in Middle West.

Anthracite—An urgent demand characterizes the hard-coal trade, and even the most favored buyers are severely pressed for tonnage. Some of the big hard coalers, who have so far met all the demands made upon them, are now swamped with orders and are falling behind miserably. The lower temperatures and the shortage of both cars and labor have tightened the situation up notably. The scarcity of bituminous has diverted considerable demand to the anthracite steam grades, the situation on which is becoming acute; some distributors, quoting exorbitant figures as the easiest way of discouraging prospective buyers, have been surprised to have such figures snapped up. Scarcely any boats can be obtained for loading north of Cape Cod with the result that New England shippers are falling steadily behind and some dealers are in desperate need of tonnage.

Bituminous—That soft-coal prices, particularly at Down East points have not advanced more rapidly, seems rather remarkable considering existing conditions. The congestion resulting from the extra all-rail traffic to make good the deficiency in the coastwise movement, causing a more or less general paralysis on both of these transportation channels, could easily result in a panicky market particularly as there is no relief in sight. The Hampton Roads piers is the only point where prompt dispatch can be obtained, and consumers with their own transportation facilities are beginning to crowd shippers there; should delays become general at this point, as is not at all unlikely, considering labor and car supply conditions in the mining fields, the situation will be serious at New England points. Prices are decidedly mixed and fluctuating daily.

Exports—Dumpings at the Hampton Roads piers for the week ended Jan. 15, as exclusively announced herewith, touched the highest level since the great boom in the export trade which culminated in September last and the past week has witnessed further material expansion in all directions. Barge and sail tonnage are so closely covered in the coastwise trade that about the only available transportation from Hampton Roads is new steamers just going into service, and evidence of the acute situation prevailing on this business is seen in the terms of a recent charter where only three days for loading and discharging were allowed with demurrage at the rate of $2,000 per day. Export returns for the year now becoming available are showing some spectacular records, the bituminous movement from Baltimore for instance being close to 2,000,000 tons or more than double that for the previous year.

Ohio Valley—The railroad embargoes eastward are proving a notably restraining influence on the market, though the situation is somewhat improved over last week when there were strong indications of a sharp reaction. The domestic trade, purely a weather proposition, has been stimulated materially by the lower temperatures, and dealers are being forced into the market for considerable tonnage. Cars are growing steadily scarcer, and all indications point to a further tightening of the situation in this respect before there is any improvement. The situation is very indeterminate with prices on steam coal fluctuating over a wide range.

Middle West—Heavy snows and gales, accompanied by unusualy cold weather, have precipitated a sharp rush for coal, at the same time seriously interrupting transportation and revived the market just as it seemed on the point of relapsing into the previous dullness. The docks at the upper Lake ports are working to full capacity and sending out a maximum tonnage while the railroads appear to have the situation well in hand, considering the difficulties incident to such severe weather. Trade conditions are generally regarded as more encouraging than at any time for a number of years, and while there have been no price changes as yet, some advances are now definitely up for consideration.

A Year Ago—A general sweeping reduction in the working schedules of the hard-coalers. Bituminous trade also less encouraging. Situation on new contracts indeterminate. Sharp break in the Middle Western boom.

BUSINESS OPINIONS

Iron Age—The delivery troubles with which buyers of steel have contended for weeks are now more aggravated than at any time, and this condition dominates the whole steel situation. New business has been quite secondary since the opening of the year. While the Pennsylvania R.R. has relaxed the embargo on export steel products at Pittsburgh so that shipments are made of anything for which vessel room has been provided, the New England embargo continues and the situation there gives manufacturers much concern. Many metal-working plants are operating only from day to day, and all are depleting their stocks, with the probability in some cases that matters will be worse before they are better. For the brass industries in Connecticut the holding up of spelter and copper shipments at Western points makes the outlook particularly bad.

Boston News Bureau—All statistics coming to hand make plain that general trade is expanding every day. Earnings are swelling in every direction. The strength in war stocks, however, does not satisfy the big banking interests. They prefer a shift of collateral to the more standard shares, and yet the industrial stocks command the speculative attention. People need to exercise patience. The position of money warrants a further expansion of both legitimate business and speculation. Whatever danger exists lies in technical rather than in fundamental conditions.

Dun—It is still noteworthy that the volume of business is overtaxing facilities in several important lines. Though production is at the maximum and active capacity is being extended wherever possible, in not a few instances demand exceeds supply and inability to obtain prompt deliveries is causing more frequent complaint. The labor situation, both in respect to actual controversies and difficulty in securing an adequate number of skilled hands, continues somewhat disturbing and acts as a brake on manufacturing at a time when unchecked operations are necessary to cope with the pressing requirements.

Bradstreet—Good business, plenty of money, high prices, activity in industry, improved collections, increased wages, cold weather, anticipations of extraordinary activity the coming spring, and scarcity of numerous kinds of materials, feature this week's reports. Commercial failures for the week are 453, against 481 last week, 366 the preceding week and 691 the corresponding week last year.

Marshall Field & Co.—Wholesale distribution of dry goods for the week shows a very large increase over the same period of a year ago. Merchants are coming to market earlier than usual, reporting satisfactory holiday business, with their stocks well sold up. Prices on practically all lines of dry goods are exceedingly firm.

Dry Goods Economist—Indications are multiplying as to the growing anxiety of buyers, especially those operating on a large scale, as to their ability to obtain adequate supplies of merchandise. Particularly is this the case as regards distant deliveries. Large operators in colored cottons, for example, are offering orders to manufacturers for the season of 1917. Incidentally, such offers are not being accepted, mills being deterred from such action by uncertainty as to raw material prices, the dye shortage and demands for higher wages in various textile centers.

American Wool and Cotton Reporter—The embargo on New Zealand wool is the principal feature of the Boston wool market, and tends to advance prices especially on foreign wools. Large amounts of foreign wools, including Capes, Australians and South Americans have recently been received at the port of Boston, the bulk sold to arrive and the rest was very quickly absorbed.

Southern Lumberman—Resumption of activity in the lumber market following the holidays is coming about more promptly than usual in most sections of the country. This activity is reflected to some extent in the actual volume of sales made, but more in the number of inquiries received. Indications for a brisk and remunerative spring business have not been so good in several years.

ATLANTIC SEABOARD

BOSTON

Firmer prices in prospect at Hampton Roads, with possible delays in loading. Georges Creek shipments practically nil. Pennsylvania offerings small, both all-rail and at tide. Marine freights unchanged. Anthracite very slow loading and certain sizes scarce.

Bituminous—Prices on Pocahontas and New River show signs of advancing. The Hampton Roads piers have been the only ones on the coast where dispatch has been good and naturally inquiry has been active from merchants and other factors with marine transportation in hand. Export inquiry has improved, partly on account of shortages at Philadelphia and Baltimore, and there is likely to be a more active demand from this quarter as the season advances. Delivered prices for cargoes, either spot or to load, have varied only a little since Dec. 15. There is not the panic for quick coal that was predicted, buying for the most part being confined to shippers who are themselves behind on obligations or consumers who are apprehensive for the months beginning Apr. 1. While stocks are small they are not depleted to the extent that was feared.

That delivered prices have not advanced sharply the past fortnight is the more remarkable because of the embargoes effective on lines into New England. These restrictions were made necessary by the extra coal traffic all-rail to make good the deficiency of boats along the coast, and it would have been in accord with precedent if prices had risen to $8 or more on cars at Providence and Boston. Should delays become general at Hampton Roads it would have a grave effect on the trade in New England.

Georges Creek is practically unrepresented in current arrivals here. One entire fleet is loading at Hampton Roads because of the shortage of coal at Baltimore. Besides the embargoes against consignments to certain tide-water points the car supply is very poor and no encouragement is given for the near future.

Quotations on the Pennsylvania grades are confined to small lots, either at or en route to the New York or Philadelphia piers, or to other small lots that were put on wheels before the recent embargoes were in force. Enough rail coal is still dribbling through at the same prices that ruled earlier, namely, $3@3.50, f.o.b. mines, for fair grades from the Cambria and Clearfield districts. A large volume of high volatile coals from the Pittsburgh region is still offering at prices down to $2.50, but the market here is still diffident about purchases of this kind.

Water Freights—There is practically no change in coastwise rates. Barge and sail tonnage is now chartered so far ahead that the only available transportation from Hampton Roads is in the form of steamers which have been so recently launched that they were not tied up on season arrangements. One good-sized boat was recently closed for a single trip at $3 to Boston, three days to load and discharge, demurrage $2,000 per day; $1.75 up to $2.25 is the range of freights from New York to points on Long Island Sound.

Anthracite—Weather conditions have been such that all of last week there were practically no arrivals at New York or Philadelphia. This means that cars were not freed at the piers and that collieries had to be closed down in many cases. The market here is getting farther and farther behind on its quota. All the shippers are swamped with orders which they cannot possibly fill before April.

Bituminous prices, f.o.b. loading port at points designated, are about as follows, per gross ton:

	Philadelphia	New York	Baltimore	F.o.b. Mine
Clearfields	$4.00@4.50	$4.25@4.80	.....	$2.75@3.25
Cambrias and Somersets	4.25@4.75	4.50@5.00	.....	3.00@3.50
Georges Creek	.....	.....	.....	.....
Pittsburgh	.....	.....	.....	2.25@2.50

Clearfields delivered alongside Boston are $5.90@6.25. Pocahontas and New River are quoted $2.85@2.90, f.o.b. Norfolk and Newport News, Va. On cars at Boston prices are $6.50@7, and the same at Providence.

NEW YORK

Anthracite scarce. Car supply short and some mines working half time. Shortage serious on Long Island. Demand for bituminous strong. No let up in embargoes. Tidewater prices firm.

Anthracite—Demand for anthracite coal continues heavy with a short supply. Scarcity of prepared sizes is becoming more apparent each day. The situation is aggravated by the lower temperatures and the apparent inability of the railroads to relieve the car situation. The mines are in many instances working little more than half time, owing to the lack of cars while the demand is constantly increasing. Embargoes continue in force and shipments are greatly restricted.

Inquiries from New England are more numerous but dealers are careful about taking orders. The situation on Long Island is serious; supply is short as a result of the freight congestion and retail prices have advanced from 25 to 50c. Some of the companies are buying coal from outside sources in order to fill regular customers' orders.

Individuals are getting full companies' schedule for prepared coals and in some cases slight premiums are reported. The steam grades are tight and prices change frequently, according to demand. Buckwheat No. 2 was the shortest early this week. Individual pea was quoted at $4.25@4.50, f.o.b.; buckwheat No. 1, $4@4.25; buckwheat No. 2, $3.50@3.75, and No. 3, $2.75@3. Retailers are invading the wholesale district urging shipments and picking up stray lots.

Current quotations, gross tons, f.o.b. Tidewater, follow:

	Lower Ports		Upper Ports	
	Circular	Individual	Circular	Individual
Broken	$5.05		$5.10	
Egg	5.30	$5.30@5.30	5.35	$5.35@5.35
Stove	5.30	5.30@5.30	5.35	5.35@5.35
Chestnut	5.55	5.55@5.65	5.60	5.60@5.70
Pea	3.50	4.25@4.50	3.55	4.30@4.55
Buckwheat	2.75	4.00@4.25	2.80	4.05@4.30
Rice	2.25	3.50@3.75	2.30	3.55@3.80
Barley	1.75	2.75@3.00	1.80	2.80@3.05

Bituminous—High prices, heavy demand and lack of supply continue to dominate the soft-coal situation at Tidewater. The market recovered from the easing up of last week and the early part of the present week saw the high prices in full force again. Embargoes continue in force and trade throughout the Eastern section of the country is considerably upset. The situation in New England is not likely to be relieved very soon according to an announcement made on Monday of this week that the New Haven road will not raise its embargo for some time to come. On that day 10,530 loaded freight cars were stalled on this railroad.

Shippers along the Baltimore & Ohio received about 30 per cent. of their requirements last week while those on the Pennsylvania report the car supply very poor. Offers of eastern Ohio and Pittsburgh coals continue to be received by local shippers.

Current quotations, gross tons, f.o.b. Tidewater, follow:

	South Amboy	Port Reading	St. George	Mine Price
Georges Creek Big Vein	$4.55@4.80	$4.55@4.80	$4.55@4.80	$3.00@3.25
Georges Creek Tyson	4.30@4.55	4.30@4.55	4.30@4.80	2.75@3.00
Clearfield:				
Medium	4.30@4.55	4.30@4.55	.....	2.75@3.00
Ordinary	4.15@4.40	4.15@4.40	.....	2.60@2.85
Broad Top Mountain	.....	.....	.....	2.60@3.00
Cambria County:				
South Forks	4.30@4.55	.....	.....	2.75@3.00
Nanty Glo	4.30@4.55	.....	.....	2.75@3.00
Barnesboro	4.30@4.55	.....	.....	2.75@3.00
Somerset County:				
Quemahoning	.....	4.30@4.55	4.30@4.55	2.75@3.00
Medium	4.20@4.40	4.20@4.40	4.20@4.40	2.65@2.85
Latrobe	4.15@4.35	.....	.....	2.60@2.80
Greensburg	4.15@4.35	.....	.....	2.60@2.80
Westmoreland	4.25@4.40	.....	.....	2.50@2.75
West Virginia Fairmont	.....	3.80@3.90	3.80@3.90	2.00@2.10
Fairmont mine-run	.....	3.80@3.90	3.80@3.90	2.00@2.10
Steam	.....	4.05@4.30	4.05@4.30	2.50@2.75
Western Maryland	.....	4.15@4.30	4.15@4.30	2.50@2.75

PHILADELPHIA

Anthracite active with large orders for stove and nut unfilled. Heavy stocking of steam coal. Car supply poor. Bituminous fluctuating due to embargoes, with demand heavy. Prices react for a time, but recover again.

Anthracite—The shippers are unusually rushed, as an immense amount of fuel continues to be put into storage. Even large buyers who usually have every attention paid to their orders, are hard pressed for coal. There is so much business offering that it is impossible to give any buyer all he wants of each size and consequently there has been much wrangling and some ill feeling. The car shortage has been the cause of most of the dissatisfaction, as under present conditions no shipper knows what to expect from day to day. One of the big companies which met practically all the demands made on it during December has fallen down miserably this month; this is understood to be due to its inability to secure P. & R. cars for shipment on that road, the claim being made that this company is turning over a large portion of its equipment to the soft coal roads. The Philadelphia & Reading Coal and Iron Co. has been able to give the best service on the Reading lines so far this month.

The situation on steam sizes becomes more acute each day. The big companies for some time have refused all new business calling for No. 1 buckwheat, orders for thousands of

tons being returned. The buyers in many cases offer to pay any "reasonable price." Manufacturers and other users of the steam free-burning coals have had their offers of 50c. over circular rates, or $1.55, refused for the hardest grades. One of the large companies always known to adhere closely to the circular, is reported to have sold rice coal at from $1 to $1.25 or 10c. to 35c. above circular, though in many instances this was due to a high rate being named to scare off a prospective buyer, who in turn surprised the shipper by snapping up the offer.

Broken is extremely hard to get on account of the production being practically covered by contracts up to Apr. 1. This contract coal takes a price of $3.35, but an occasional car that gets on the outside market brings $3.60. Egg continues to drag with the individuals and is the only size causing them uneasiness, but the companies are having no trouble moving it. Stove and chestnut are equal in demand and, of course, bring full circular of $4.10 and $4.25. The increased efforts of the individuals to buy at these prices from the companies shows that many of the city's smaller dealers and out-of-town buyers are willing to pay premiums.

The prices per gross ton, f.o.b. mines for line shipment and at Port Richmond for the tide, are as follows:

	Line	Tide		Line	Tide
Broken	$3.60	$4.85	Pea	$2.55	$3.30
Egg	3.85	5.10	Buckwheat	1.55	2.30
Stove	4.10	5.10	Rice	.90	1.80
Chestnut	4.25	5.35	Barley	.55	1.30

Bituminous—The market is fluctuating with price changes almost hourly. The chief deterrent to the movement at the present time is the embargoes. A strict embargo was placed early in the week at all the gateways to the north and east so that Philadelphia was left as the only open territory and as a consequence prices sagged badly, with an average drop of 50c. all around. Many shippers realizing that this was only temporary, refused to sell, preferring to run the risk of car demurrage. Later there was a recovery and prices turned upward again. Because of the conflicting conditions it is difficult to list quotations, but the following prices per gross ton at mines will give a good idea of the state of the market in this respect at the present time:

Georges Creek Big Vein	$3.10@3.25	Fairmont gas, ¾	$2.25@2.35
South Fork Miller Vein	2.75@2.85	Fairmont gas, mine-run	2.10@2.15
Clearfield (ordinary)	2.60@2.70	Fairmont gas, slack	1.70@1.80
Somerset (ordinary)	2.60@2.70	Fairmont lump, ordinary	2.00@2.10
West Va. Freeport	2.45@2.50	Fairmont mine-run	1.80@1.90
		Fairmont slack	1.70@1.80

BALTIMORE

Market stiffening up again. B. & O. lifts embargo. Real winter weather boosts anthracite business. Some bay ports closed.

When the B. & O. announced an embargo to the north on coal off its lines, the market here broke sharply but during the past week it held steady. Over Sunday the B. & O. made a gradual break in its embargo, as the P. & R. let it be known that it was gradually cleaning up its congestion. The lifting of the embargo was expected to considerably strengthen prices here as soon as the surplus at tide is wiped out.

Prices to the trade here are about as follows:

	Mines	Balt.*		Mines	Balt.*
Geo. Crk. Big Vein	$2.50	$3.86	Fairmont		
Geo. Crk. Tyson	2.25	3.43	Ordinary mine run	$0.95	$2.43
Clearfield	1.85	2.93	Ordinary ¾	1.05	2.53
South Fork	2.00	3.18	Ordinary slack	.85	2.33
Latrobe	1.75	2.83	Low sulphur mine-run	Out of market	
Somerset (best)	2.00	3.18	Low sulphur ¾	Out of market	
Somerset (good)	1.75	2.93	Low sulphur slack	Out of market	
Quemahoning	2.00	3.18			
Freeport	1.50	2.68			
Miller Vein	2.00	3.18			

* F. o. b., outside Capes.

Real winter weather, with temperatures around ten degrees, caused a rush of householders for anthracite. Dealers are still fairly well supplied as a whole. The hard freeze has closed the upper Chesapeake and many of the smaller towns on the eastern and western shores of Maryland, which rely largely on fuel shipment by barge.

Official figures have been announced for export fuel shipments from Baltimore during 1915. The bituminous total was 1,901,466 tons; the coke loading, 35,231 tons and the anthracite shipment, 3,154 tons. The total for bituminous was nearly 1,000,000 tons greater than for the year 1914.

HAMPTON ROADS

Shipments for week show up well. Demand good and prices range from $2.75 to $2.85. Piers working at full rated capacity.

Dumping at Hampton Roads piers have shown up well, although the amount of coal going foreign has been somewhat light. The movement to Italy during the week has amounted to probably less than 10,000 tons. The coastwise business has been brisk and all piers have been kept busy; in fact, to keep up on tonnage the Chesapeake & Ohio and Virginia railways worked all day Sunday, Jan. 8, and have worked steadily day and night since that time. A large amount of the vessel tonnage loaded has consisted of barges which have of course been for the coastwise trade. Some of these barges have been so small that in order to safely make the trip to their New England discharge ports they have been compelled to take the inside water route rather than venture outside the Capes.

The accumulation of coal is somewhat less than it has been for some time, although there is ample at Tidewater and on cars moving to take care of vessel tonnage promptly. The cold weather has considerably hampered the working at the piers, as the coal has been frozen in the cars. This has made the dumping slow and in some cases it was necessary to use picks in order to loosen the coal from the sides and bottom of the cars.

So far as can be ascertained prices are ranging from about $2.75 to $2.85, according to the amount of coal desired.

Railroad Tonnages—Dumpings over the local piers for the past five weeks compare as follows:

	Week Ending				
Railroad	Dec. 18	Dec. 25	Jan. 1	Jan. 8	Jan. 15
Norfolk & Western	104,942	162,494	112,613	122,342	144,969
Chesapeake & Ohio	55,503	96,620	91,177	92,235	105,053
Virginian	61,728	54,132	66,990	64,428	88,396
Totals	222,173	313,246	270,780	279,005	338,418

Ocean Charters, Clearances and Freights

OCEAN CHARTERS

The following charters have been reported from various sources during the past week:

VIRGINIA

Vessel	To	Tons	Rate
Kim	Rio Janeiro[1]	3,342	15.00
Joel Cook	Bermuda	319	4.00
Jacksonville	Bermuda	547	5.00[2]
Havur	River Plate	2,089	
E. Starr Jones	Rio de Janeiro	787	
Moldegaard	Havana	1,788	
D.H.Rivers	San Juan	963	4.00

[1] Or Buenos Aires. [2] Discharged and port charges.

PHILADELPHIA

Vessel	To	Tons	Rate
Ponce	Guanica[1]	2,519	
M. R. Bohannan	Charleston	579	1.25
E. A. Bayles	Providence	253	1.75
Ulrik Holu	Havana	930	
Merinoth	Italy		

[1] P. R.

ATLANTIC RANGE

McClure	Halifax	191	2.65
Lawson	Halifax	274	2.65

VESSEL CLEARANCES

The following steamers have cleared from various ports during the week ended Jan. 15:

NORFOLK

Vessel	Destination	Tons
Guernsey[1]	Montevideo	5,404
Thorsa[1]	Manzanillo	2,500
Washington[2]	Leghorn	5,000
Havur[3]	Buenos Aires	4,450
Ulysses[4]	Cristobal	12,000
F. B. Balano[5]	Santo Domingo	300
Mae[6]	Vera Cruz	3,000
Frankrig[1]	Kingston	2,500
Ester Ann[2]	St. Georges	1,113
Palmer[1]	Montevideo	3,150
Frances M.[3]	Para	1,590

NEWPORT NEWS

Vessel	Destination	Tons
Kronborg[7]	Barbadoes	5,013

PHILADELPHIA

Creadick	Cardenas	
C. French	Humacoa, P. R.	
F. J. Lisman	Havana	3,250
Bellatrix	Havana	3,663

[1] Castner, Curran & Bullitt, Inc. [2] Pocahontas Fuel Co. [3] Smokeless Fuel Co. [4] W. C. Atwater. [5] C. G. Blake Co. [6] Baker Whitley. [7] Berwind White.

OCEAN FREIGHTS

Since our last report the freight market has advanced very materially in all directions. A steamer of 8,500 tons coal capacity has been chartered to load coal at Virginia for Rio at equal to $13.10 with 1,000 tons per day discharge; and a steamer of about 6,000 tons coal capacity, from Virginia to St. Lucia at $7.72. There are innumerable export coal orders in the market and very few steamers available.

We would quote freight rates on coal by steamer as follows:

To	Rate	To	Rate
Havana††	$3.00@3.25	Bermuda	$4 50
Cardenas or Sagua	4.75	Vera Cruz	6.50@ 6.75
Cienfuegos	4.50@4.75	Tampico	6.50@ 6 75
Port au Spain, Trinidad	6.75	Rio	13.25
St. Lucia	6 50	Santos*	13.50
St. Thomas	6.25	Montevideo	13.50
Barbados	6.75	Buenos Aires or La Plata†	13.50
Kingston	4.50@5.00	Rosario	14.40
Curacao	6.25	West Coast of Italy	29.50
Santiago	4.50@5.00	Barcelona**	25.20
Guantanamo	4.50@5.00	Valparaiso or Callao	15.00
Demerara	7.00@8.00	Marseilles	25.20

* Consignees paying dockage dues. ** Spanish dues for account. † Quotations on Plate coal by British steamers; neutral steamers are more difficult to obtain and the rates are always higher. †† For very quick discharge.

W. W. Battie & Co.'s Coal Trade Freight Report.

OHIO VALLEY

PITTSBURGH

Steel works' strikes ended, and coal market partly recovered. Many railroad embargoes. Car supply growing shorter.

The market has recovered somewhat from the softness reported a week ago, but not altogether. Other influences, apart from the strikes at Youngstown, which were blamed for the recent decline, have intervened. The strikes are practically settled, there being a constant stream of men back to work last week, with one department after another being put in operation, and coal shipments have been resumed to the plants, both byproduct and fuel. The general and almost universal embargoes on coal destined for the East are stated to be holding down the market, but there is also somewhat more reserve on the part of buyers who refuse to pay prices currently asked if the coal is intended only for stocking purposes. This week opened with a sharp cold snap and this in turn has stiffened the views of operators. Cars have been growing still scarcer and the supply is expected to be much less at the end of the week.

The market has recovered part of the recent decline and is 15@20c. higher than at last report, with prospects of further advances, depending largely on weather conditions as affecting car supply. There are no quotable contract prices. We quote free coal approximately as follows, sales being made at rather variant prices according to circumstances: Slack, $1.35@1.60; mine-run, $1.40@1.75; ¾-in., $1.50@1.85; 1¼-in., $1.65@2, per net ton at mine, Pittsburgh district.

BUFFALO

Bituminous still more uncertain. No dependable price that the consumer will accept. Anthracite scarce but only moderately active. Car supply still shorter.

Bituminous—The unsteadiness of the market appears to grow worse. As a rule all quotations of Pittsburgh or Allegheny Valley are merely what shippers are asking, in view of what can be obtained eastward. All consumers who can use Ohio or Panhandle coal are doing so, as prices on these are sometimes down as low as $1.25, at the mine, for mine-run, which is more than a dollar less than was being paid. Shippers who ordinarily supply this market are all looking eastward for sales and they are getting them so far as the transportation situation will permit.

The Pocahontas and near-by districts have been so cut off from some of their Eastern customers that they have shipped considerable coal to the Toronto district by way of Detroit, paying a rate that is commonly prohibitory. Buffalo has not taken that coal because the Ohio and other southwestern coals are offered at much lower prices. New rates to eastern New York and New England for Ohio, Bessemer and Panhandle coals are going in and efforts are making to advance these prices to the Buffalo trade on that account. Quotations are:

	Pittsburgh	Allegheny Valley	Penn Smokeless
Lump	$3.50	$3.30	$3.35
Three-quarter	3.35	3.15	.....
Mine run	3.25	3.05	3.00
Slack	2.80	2.75	3.00

Prices are f.o.b. cars per short ton, except east of Rochester and Kingston, Ont.

Anthracite—The demand is not as heavy as was expected, only the small sizes showing a normal activity. The larger demand reported from the coast seems to have absorbed the surplus from the mines, so that some of the shippers are temporarily short, but the problem is not a serious one. The shortage has cut off the loading into Lake vessels for the time. There is now about 40,000 tons afloat and most of the shippers are indifferent to this side of the trade at present.

There is now complaint from anthracite shippers also of car shortage and with the weather now more severe the movement is likely to be still further reduced. Much drifting snow and low temperatures make city deliveries difficult, especially by horse conveyance, though most coal trucks are now motor driven. There is report that certain anthracite companies have added 10 to 15c. a ton for meeting the Pennsylvania compensation tax, but the prices are not yet affected here. Quotations are:

	Cars	Vessels	Retail	Custom
Grate	$5.60	$5.85	$5.40	$6.65
Egg	5.85	6.10	5.65	6.90
Stove	5.85	6.10	5.65	6.90
Chestnut	6.10	6.35	5.90	7.15
Pea	4.30	4.55	4.30	5.60
Buckwheat	3.25	3.50	3.25	4.50

Car and vessel deliveries are per long ton, the others, per short ton. An addition of about 25c. per ton is made on all curb deliveries for putting in.

TORONTO, CAN.

Market unsettled with a strong tone. Pennsylvania smokeless out of the market.

Stocks of bituminous coal have been considerably reduced by heavy demands and retarded deliveries. The market is unsettled with every indication of further increase in prices. Anthracite is moving steadily with good supplies on hand. Quotations for best grades per short ton are as follows: Retail, anthracite egg, stove and nut, $8; grate, $7.75; pea, $6.75; bituminous steam, $5.25; screenings, $4.50; domestic lump, $6. Wholesale f.o.b. cars at destination, bituminous three-quarter lump $4.40, screenings $3.75. Pennsylvania smokeless lump, $4.50.

DETROIT

Fair activity in the steam coal trade. Demand for domestic grades rather quiet. Anthracite moves slowly.

Bituminous—In the steam-coal trade there has been a greater activity with prices fluctuating rapidly. Small coal is the strongest feature of the market and shippers find difficulty meeting the needs of their customers. Prices range from $1.15 to $1.25 f.o.b. mines for slack of good quality and mine run is being sold at practically the same. A shipper of Ohio coal has offered three-quarter lump with slack as mine-run at $1.25, plus freight. Transportation conditions on the Grand Trunk in Detroit are making deliveries uncertain and delayed, while embargoes are going on and off in almost daily sequence. Shipments over this road suffer interruptions because of the situation in Detroit.

Anthracite—All sizes of anthracite appear sluggish. Chestnut the most active size appears to be selling at regular rates one day and at a small premium the next. Arrivals are slow because of freight congestion.

Lake Trade—Shippers are finding vessel owners unwilling to close contracts and the situation seems to have resolved itself into watchful waiting, with the prospect that at least 40c. will be paid where good dispatch is given.

COLUMBUS

The colder weather has stimulated demand. Steam business continues strong. Considerable buying in the open market.

The lower temperatures have caused a flurry in the domestic trade. Dealers are placing orders for immediate delivery and stocks are rather low. The domestic trade is purely a weather proposition. Retail trade has been brisk and deliveries are prompt. Fancy grades, such as Pocahontas and White Ash, are in good demand. Car shortage is not so bad and West Virginia coals are more prompt in arriving.

The steam business continues strong in every locality. Buying in the open market is now the rule as all consumers are gradually increasing their requisitions. Premiums are freely paid for spot shipments. The small sizes are especially strong and $1.10 to $1.15 is frequently paid for nut, pea and slack.

Production has been rather active during the past week. High waters interfered with mining in the Pomeroy Bend district for a few days but in eastern Ohio the production was quite large. The Hocking Valley and strictly domestic fields also showed up well. Prices in Ohio fields f.o.b. mines, per short tons, are as follows:

	Hocking	Pomeroy	Eastern Ohio	Kanawha
Re-screened lump	$1.60	$1.65	.....	.....
Inch and a quarter	1.50	1.50	$1.35	$1.50
Three-quarter-inch	1.35	1.40	.....	1.35
Nut	1.25	1.30	.....	1.25
Mine-run	1.20	1.25	1.05	1.10
Nut, pea and slack	1.10	1.15	1.00	1.00
Coarse slack	1.00	1.05	.90	.90

CLEVELAND

Heavy demand for steam coal, but domestic grades moving slowly. Eastern call for Ohio fuels not helping prices materially.

Steam coal of all sizes, particularly slack, continue in good demand and, although plenty of coal is available for quick delivery, jobbers are experiencing little trouble in moving their stocks. Heavy shipments over Sunday caused some Middle District slack to sell at $1.90 Cleveland early in the week, but the price stiffened later and closed at $2. Since No. 8 rates were published to Eastern points considerable of this coal, with Bergholz and Coshocton leading, is finding its way into Cleveland, about the only No. 8 offered being that off the B. & O. Notwithstanding the high prices being paid East, and on the line, No. 8 coarse coal does not seem to advance very perceptibly here, ¾-in. and 1¼-in. lump both being offered freely at $2.05, Cleveland.

Mild weather the fore part of the week caused the usual slump in the domestic trade, but prices were not affected except possibly on Pocahontas, which was offered in the lump and egg sizes at from $3.10 to $3.45 Cleveland in gondola cars and 15c. less in hoppers.

CINCINNATI

Severe weather has affected the market some but dealers' supplies are still large. Nut and slack is scarce and high. Car supply improving.

The coldest weather of the winter has failed to help the domestic market materially, as the retail trade is still well stocked up, and is not inclined to purchase heavily owing to the lateness of the season. Prices stiffened somewhat, however. Nut and slack remain the strongest item on the list, on account of the limited production of the prepared grades and the inability of many consumers to use mine-run for steam purposes in their automatic stokers. Small sales of nut and slack for immediate requirements are reported as high at $1.20 per short ton f.o.b. mines and $1.10 for the better grades was fairly common, while 75@85c. was the very bottom of the market. An improved car supply is reported, four and five days' run being the rule on the C. & O. The labor supply has been somewhat affected by extensive sickness in some quarters, caused by the epidemic of grip and pneumonia.

LOUISVILLE

Cold weather stimulates the market. Suspension of rate increase causes relief.

Cold weather has greatly stimulated the domestic demand and there are many orders received for rush shipments. Steam coals continue the feature of the market and are showing increasing strength. Eastern nut and slack have reached the dollar mark, ranging from 95c. to that figure, and some of the local operators are predicting that it will go to $1.20 in the near future. Western Kentucky nut and slack has also shown a marked increase in the demand and has advanced to 65 and 70c. All steam coals are strong and there are various dealers who are making inquiries for the larger sizes in order to crush them.

The suspension of the proposed 15c. increase in the rates to the Northern market has been received with a great deal of relief. Talk of a probable strike in the Eastern field continues and there is considerable accumulating of supplies.

Prices on the first grades of eastern Kentucky block continue at from $1.75 to $1.85 with some of the fancy brands going higher. The Northern market, as customary, is paying better prices. Other sizes range downward.

BIRMINGHAM

Market on steam coal fair. Lump coal quiet. Car supply moderately good.

The demand for steam coal is only fair, and centers more particularly on the higher grades. Prices remain about the same. Domestic coal has been rather quiet, though the recent cold weather has brought out some inquiries for small tonnages. Blacksmith coal is moving satisfactorily, with no change in price. While the car situation is not as good as desired, little tonnage is being lost from this cause.

COKE

CONNELLSVILLE

Prompt furnace coke back to former level. Cold weather may cause further advance. Production and shipments normal again.

Shipments of coke to the five furnaces in the Youngstown district that were banked on account of strikes were resumed the latter part of last week and the market promptly stiffened. An inquiry for about 4,000 tons of furnace coke for immediate shipment brought out no quotations below $3, for strictly standard coke, and the purchase was made at this figure, establishing the market again at the figure that had obtained previous to the 50c. drop reported a week ago, which was attributed generally to the strikes at Youngstown.

Last week closed with the spot market at $3, as indicated, and this week the market is fully as high, some quotations being made at $3.25 and even higher, but there has been no buying thus far to speak of. The weather turned suddenly cold Sunday night, and operations in the coke region have been somewhat curtailed. How well furnaces are provided against temporary decreases in shipments will be developed before the end of the week, and any considerable demand for spot coke would no doubt send prices up sharply. There are no negotiations on contract, but the market can be quoted nominally on the old basis for first half or for the year. Foundry coke is a shade easier, on account of the continued embargoes on shipments to New England, but not a great deal of coke is thus released. We quote: Furnace coke, prompt, $3@3.25; first half, $2.35@2.50; year, $2.25@2.35; foundry coke, prompt, $3.50@4; contract, $3@3.50, per net ton at ovens.

The "Courier" reports production in the Connellsville and lower Connellsville region in the week ended Jan. 8 at 429,968 tons, an increase of 50,190 tons, and shipments at 431,644 tons, an increase of 88,071 tons. The latter week was the week of the Greek Christmas, the former being that of the regular calendar Christmas, and the restoration of the previous rate of production and shipments is somewhat more than was expected.

Buffalo—There is an active consumption of coke everywhere, but the price has lately been reduced on account of strikes and blockades, which caused an accumulation of the output at the ovens. At last reports shipments were again made to Youngstown, where the principal strike had taken place. Quotations are not very uniform, especially as reports vary as to the demand for the lower grades. A fair price, f.o.b., is $5.85 to $6 for best 72-hr. Connellsville foundry and $4.85 for 48-hr. furnace.

Chicago—A tense situation is still displayed in the coke market. Byproduct coke ovens are unable to take care of orders, and gas-house coke demands still expand at increased price levels. Higher prices are asked for all grades. Prices per net ton, f.o.b. cars Chicago, are as follows: Byproduct, foundry, $6@6.25; byproduct, domestic, $4.95@5.25; Connellsville, $6.50@6.75; Wise County, $6.25@6.50; gas coke, $4.50@5.

St. Louis—The coke situation was satisfactory the past week. Domestic demand for byproduct and gas house continues good while a few orders were placed for petroleum. Industrial demand holds up well. No increase was made in prices. The following prices are quoted, per net ton f.o.b. cars, St. Louis: Byproduct (all sizes), $5; gas house (lump and egg), $4.25; petroleum (lump), $6.75.

Birmingham—The manufacturers of furnace coke are finding a ready market for their product, as more furnaces are in blast in this district than for many years, and idle ovens have been brought back into service to meet the demand. The price of furnace coke remains around $2.75@3. Foundry coke is moving in about the normal tonnage with prices around $4.

MIDDLE WESTERN

GENERAL REVIEW

Zero weather expands domestic trade. Coarse steam coals strong. Screenings slightly easier. Anthracite market fair.

Owing to abnormally low temperatures over the Western country during the last few days, the domestic market which had been sluggish has revived. The temperature has ranged from 10° to 50° below zero at many points in the West. Activity followed, mainly because a good many country dealers are not heavily stocked with domestic sizes. Prospects are for better consumption of domestic sizes during the balance of the month, and trade conditions generally are more encouraging than for several years at this season. Transportation has been retarded by reasons of heavy snows, sharp winds, and unusually cold weather.

Screenings are slightly easier owing to increased storage of larger steam sizes and mine-run. No pronounced changes have occurred in prices, but there is again talk of advancing the list on Indiana and Illinois domestic lump sizes. Washed coal for steam purposes has been strong, and there seems to be an increased amount of free screenings available. It is reported that most of the large industrial interests have now fully covered their requirements for storage coal.

CHICAGO

Cold wave causes rushing business. Coarse steam coals eagerly sought.

Southern Illinois egg coal has been the leader recently. More is being ordered than lump, and it seems to be preferred to No. 1 nut. Steam coal orders are in excess of production, and 2-in. screenings are selling freely at $1 per ton. The cold wave has caused many telegraph and telephone orders to be received at the mines, which cleaned up accumulated domestic sizes. Circular prices are rigidly adhered to.

Springfield screenings have been averaging around 85c. per ton; domestic demands increased considerably Wednesday due to zero weather, with the result that the accumulated lump immediately commenced to move at a price of $1.65 to $1.75.

Indiana shipments are active due to steady adsorption of steam and domestic sizes. Car scarcity is appearing. Nos. 4 and 6 domestic lump are selling at from $1.65 to $1.75, and screenings are averaging 90c. per ton. Better grades of mine-run have reached $1.20.

Smokeless coals show further improvement, and less tonnage is now being sold under list prices, although lump is not as well off as the other sizes. What little Pennsylvania smokeless comes to this market is sold at full circular. Kentucky coals are firmer, but absorption of Hocking grades has decreased somewhat.

Complaints are still made that all-rail anthracite is slow in reaching this territory. Anthracite trade is only fair, with a heavier demand for chestnut than the other sizes. No immediate prospect of a deficiency in tonnage seems to be apprehended, and consumers appear to be taking no precautions to assure supply in case shipments should cease as a result of labor difficulties in the spring.

Quotations in the Chicago market are as follows per net ton, f.o.b. mines:

	Williamson and Franklin Co.	Springfield	Sullivan	Clinton	Knox and Greene Cos.
Lump	$1.60@1.75	$1.50@1.75	$1.60@1.70	$1.50@1.75	$1.35@1.50
Steam lump	1.30@1.35	1.25@1.35	1.20@1.30	1.35@1.40	1.30
2½ and 3-in. lump	....	....	1.40@1.50	1.40@1.50	1.25@1.30
1½-in. lump			1.25@1.35	1.25@1.35	
Egg	1.75	1.50@1.60	1.15@1.25	1.15@1.25	1.20@1.25
Nut		1.60@1.65	1.10@1.15	1.15@1.20	1.10@1.15
No. 1 washed	1.75	....	1.50	....	....
No 2 washed	1.50@1.60	....	1.40	....	....
No 1 nut	1.75	....	....	....	....
No 2 nut	1.50@1.60				
Mine-run	1.15@1.20	1.05@1.10	1.00@1.10	1.05@1.10	1.10
Screenings	.85@ .90	.85@ .95	.80@ .85	.85@ .95	.90@1.00

	Harrisburg & Saline Co.	E. Kentucky	Pocah. & W.Va.Smok'l.	Penna. Smokeless	Hocking
Lump	$1.60@1.75	$1.65@2.40	$1.85@2.00	$1.85@2.00	$1.85@2.00
1¼-in. lump	1.39@1.35		....		1.50@1.60
Egg	1.75	1.50@2.00	1.95@2.00	1.85@2.00	....
Nut		1.25@1.70	1.60@1.75	1.60@1.75	....
No. 1 nut	1.65@1.75	....	....	....	....
No. 2 nut	1.50				....
Mine-run	1.15	1.25@1.35	1.25@1.40	1.25@1.40	1.25
Screenings	.85@ .90	.85@ .95	....	....	....

ST. LOUIS

Southern Illinois screenings weaker, others hold firm. Larger sizes inactive. Industrial demand quiet. Storing increasing.

At the close of last week there was a manifest tendency toward weakness on the part of Franklin and Williamson County screenings, as a result of the heavy shipments due to increased mining operations. The buyers quickly took advantage of the situation and exerted their energies to depress prices. The first days of this week witnessed a decline of 10c. per ton, the prevailing price standing at 75c. per ton at the mines. Heavy buying occurred and at the close of the week there was a strong tendency to return to the previous high mark.

Standard, intermediate and other grades of screenings were firm at 75c. per ton, with a very few cars sold at 70c. Owing to high temperatures dealers were completely out of the market the fore part of the week, but when the thermometer fell below zero, there was a strong buying movement and domestic sizes bid fair to remain in good demand for a few days. Similar conditions prevailed in the country.

Prices, per net ton, f.o.b. cars at mines, are as follows:

	Williamson and Franklin	Staunton and Mt. Olive	Montgomery Co.	Intermediate	Standard
8-in. lump	....	....	....	$1.25@1.35	$1.10@1.15
6-in. lump	$1.60@1.75	$1.25@1.35	$1.25@1.40	1.25@1.35	1.10@1.15
3-in. lump	1.40@1.65	1.15@1.25	....	1.25@1.35	....
2-in. lump	1.35@1.50	1.15@1.25	....	1.15@1.20	.95@1.00
1½-in. lump	1.30@1.50	....	1.10@1.15	1.10@1.15	.95@1.00
6x3-in. egg	1.40@1.65	....	1.25@1.40	1.25@1.35	1.05@1.15
6x2-in. egg	....	....	1.20@1.25	1.10@1.15	.95@1.00
6x1½-in. egg	1.30@1.50	....	1.10@1.15		
No. 1 nut	1.25@1.35	....	1.10@1.25	1.10@1.15	.95@1.00
No. 2 nut	1.25@1.35	90@1.00	....	1.00@1.05	.95@1.00
Mine run	1.10@1.15	1.00@1.05	1.05@1.10	1.00@1.05	.90@ .95
Screenings	.75@ .80	.75@ .80	.75@ .80	.75@ .80	.75@ .80
Washed					
No. 1 nut	1.60@1.75	1.50@1.60	....	1.50@1.60	1.50@1.60
No. 2 nut	1.35@1.50	1.35@1.50	....	1.35@1.50	1.25@1.40
No. 3 nut	1.35@1.50	1.30@1.40	....	1.30@1.40	1.25@1.40
No. 4 pea	1.35@1.50	1.25@1.40	....	1.25@1.40	1.20@1.30
No. 5 slack	75@ .80	.75@ .80	....	75@ .80	.75@ .80

DULUTH

Coal movement heavy. Zero weather shakes out many orders. Prices remain very firm.

The severest blizzard in many years struck Duluth the earlier part of the week. Intensely cold weather occurred, the mercury in some instances touching 38° below zero and there was the usual flood of rush orders. Docks are working to full capacity.

The railroads have the situation well in hand, considering the many difficulties incident to a week of cold and stormy weather and very few complaints are heard as to lack of car service or delays in shipments. Prices remain very firm, and an advance in some of the sizes of smokeless coal have been announced by some of the dock companies. Prices f.o.b. cars per short ton, at Duluth, are as follows:

	Yough	Splint	Hock	Smokeless	Elkhorn
Lump	$3.40	$3.40	$3.40	$4.75	$3.75
Dock run	3.10	3.10	3.05	3.25	3.25
Egg, stove and nut	3.40	3.40	3.40	4.75	3.65
Screenings	2.40	2.40	2.25	2.75	2.55

Anthracite—The zero weather caught many householders with short supplies and there has been a run on the retail and dealer trade during the past week. Many more teams and sleighs loaded with coal were in evidence on the streets and the movement of the domestic sizes was quite heavy. Quotations are as follows, per short ton, f.o.b. cars Duluth: Nut, $7.10; egg and stove, $6.85; pea, $5.55; buckwheat, $4.

PRODUCTION AND TRANSPORTATION STATISTICS

NORFOLK & WESTERN RY.

The following is a statement of coal handled by the N. & W. Ry. during December and the past four months in short tons:

	September	October	November	December
Pocahontas Field	1,620,862	1,720,613	1,482,015	1,387,033
Tug River District	354,981	375,743	339,154	328,558
Thacker District	230,198	264,619	268,299	258,980
Kenova District	89,921	95,438	92,587	86,724
Clinch Valley District	144,234	142,187	118,553	123,528
Other N. & W. Territory	3,798	4,636	5,277	7,127
Total N. & W. Fields	2,443,494	2,603,236	2,305,885	2,191,950
Williamson & Pond Creek	87,152	95,188	90,052	87,365
Tug River & Ky. R.R.	....	60,050	57,039	51,919
All other railroads	324,913	268,762	245,730	139,593
Grand total	2,855,559	3,027,236	2,698,706	2,470,827

CHESAPEAKE & OHIO RY.

The following is a comparative statement of the coal and coke traffic from the New River, Kanawha and Kentucky districts for November and the five months of the fiscal years 1914 and 1915, in short tons:

	November				Five Months			
Destination	1915	%	1914	%	1915	%	1914	%
Tidewater	367,659	17	246,545	16	2,165,030	20	1,609,526	17
East	241,995	11	210,076	13	1,026,523	10	1,054,772	11
West	1,331,292	62	1,057,606	68	6,671,802	62	6,282,740	66
Total	1,940,946		1,514,227		9,863,355		8,947,038	
From Connections								
Bituminous	200,297	10	41,242	3	907,383	8	543,353	6
Anthra. (local)	188		20		1,109		35	
Anthracite	934		1,209		6,827		7,753	
Total	2,142,365	100	1,556,698	100	10,778,674	100	9,498,179	100
Coke	38,491		11,304		149,810		79,670	

MIDDLE WESTERN ROADS

The following is a comparative statement of coal handled over the 17 principal Middle Western carriers for October, and the first ten months of 1915 compared with the same periods last year:

	October		10 Months	
	1914	1915	1914	1915
Illinois Central	762,074	881,782	6,326,940	6,301,686
C. & E. I. R.R.	622,813	759,305	5,579,237	5,166,159
C. B. & Q. R.R.	611,541	712,156	4,688,898	4,668,081
C. C. C. & St. L. R.R.	465,826	548,961	3,998,064	4,188,884
Vandalia Line	416,413	461,008	3,645,255	3,963,761
C. T. H. & S. E. Ry.	267,776	327,826	2,496,695	2,520,582
C. & A. Ry.	155,558	256,238	1,432,317	1,647,783
Wabash R.R.	180,554	157,775	1,284,931	1,293,491
St. L. I. M. & S. Ry.	145,629	163,988	1,291,421	1,309,764
Southern Ry.	105,795	170,325	1,219,802	1,003,248
B. & O. S. W. R.R.	120,266	104,026	685,441	820,667
St. L. T. & E. R.R.	72,262	64,199	568,141	497,770
St. L. & O. F. Ry.	52,827	75,763	439,422	530,865
L. & M. Ry.	64,247	58,350	423,877	400,625
C. I. & L. Ry.	45,454	64,158	471,327	552,102
C. P. & St. L. Ry.	45,571	60,617	303,158	365,452
C. & N. W. Ry.	28,506	38,352	268,737	334,663
Totals	4,163,112	4,904,829	35,123,663	35,565,583

FOREIGN MARKETS

GREAT BRITAIN

Dec. 31—The market is firm and the tendency is toward an advance in prices. Much, however, will depend upon the tonnage supply. Quotations are approximately as follows:

Best Welsh steam	Nominal	Best Monmouthshires	$6.00
Best seconds	Nominal	Seconds	5.76
Seconds	$6.00	Best Cardiff smalls	3.60
Best dry coals	6.24	Cargo smalls	2.16

The prices for Cardiff coals are f.o.b. Cardiff, Penarth or Barry, while those for Monmouthshire descriptions are f.o.b. Newport, both net, exclusive of wharfage.

Freights—Chartering is fairly active and rates continue strong. Rates are approximately as follows:

Gibraltar	$7.92	Naples	$15.48	St. Vincent	$8.40
Marseilles	14.47	Alexandria	16.80	River Plate	9.60
Algiers	9.60	Port Said	16.80		
Genoa	15.84	Las Palmas	7.80		

Coal Contracts Pending

The purpose of this department is to diffuse accurate information of prospective purchases and prices with a view to affording equal opportunity to all, promoting market stability and inculcating sound business principles in the coal trade.

Supplemental Notes

Under this heading additional or supplemental information regarding old contracts appears, together with the page number of the original notice.

1889—St. Louis, Mo.—Purchases on this contract (Vol. 8, p. 597), which provides for furnishing the requirements of the Standard Stamping Co., will be confined to the open market indefinitely. Address Pur. Agt. Porter Wiegand, Standard Stamping Co., St. Louis, Mo.

+1815—Moose Jaw, Saskatchewan, Can.—No award had been made on this contract (Vol. 8, p. 1089) up to Jan. 10. The contract provides for furnishing the City Power Plant with approximately 12,000 tons of coal. Address Com. W. F. Heal, Moose Jaw, Saskatchewan, Can.

1820—Somerset, Penn.—Bids have been received on this contract (Vol. 8, p. 1089, Vol. 9, p. 148), which provides for furnishing and delivering coal for use in the local pumping station and municipal building during the ensuing year as follows, for mine-run coal per bushel: Economy Coal Co., 6c.; C. L. Davis & Co., 6½c.; W. A. Brown, 6½c. Address Secy. C. E. Pile, Somerset, Penn. (No. 467, Vol. 7, pp. 628, 750.)

+1847—Mare Island, Calif.—Bids have been received on this contract (Vol. 8, p. 1093), which provide for furnishing the Navy Department with 300 tons of coke as follows: Balfour, Guthrie & Co., San Francisco, Calif., $5.50; Debevoise-Anderson & Co., New York, $3.85; Marshall, Matlack & Co., Philadelphia, $3.65; Romann & Bush Pig Iron and Coke Co., St. Louis, Mo., $4.50; Woods, Hubbard & Gunn, San Francisco, Calif., $4.50; for delivery at Mare Island the Western Fuel Co., San Francisco, Calif., bid $17.95. Address Paymaster Gen. of the Navy, Samuel McGowan, Washington, D. C.

1863—Bellefontaine, Ohio—Awards on this contract (p. 36), bids on which were opened Dec. 29, will not be made until about the middle of the current month. Address Clk. Vance R. Horn, Pub. Ser. Dept., Bellefontaine, Ohio. (No. 74, Vol. 7, p. 275.)

1890—Cheboygan, Mich.—The requirements on this contract (p. 107) should have been 150,000 tons instead of 150 tons as previously noted. The contract is for the requirements of M. D. Olds and is to be for West Virginia mine-run coal with deliveries to start in the spring. Address M. D. Olds, Cheboygan, Mich.

+1916—New York, N. Y.—But one bid was received on this contract (p. 108), providing for furnishing 2,000 tons of No. 3 buckwheat coal, and no award has as yet been reported. The bid submitted was by Pattison & Bowns, who offered to furnish the coal at $4.67 per ton. Deliveries are to be completed in 30 days. Address Com. R. A. C. Smith, Dept. of Docks and Ferries, Pier "A," Ft. of Battery Pl., New York, N. Y. (No. 1583, Vol. 8, pp. 700, 828.)

New Business

Volume and page number in parenthesis at the end of an item indicate where the previous announcement, bids and awards on that contract may be found.

1983—New York, N. Y.—The Hastings Pavement Co. will receive bids until Jan. 25 for furnishing its annual fuel supply for the year beginning Apr. 1. From 6,000 to 9,000 long tons will be required and quotations should be made f.o.b. alongside the company's dock at Hastings-on-Hudson. A good grade of bituminous mine-run steam coal is required and deliveries are to be made in cargoes of between 400 and 600 gross tons. Address Pres. E. J. Morrison, Hastings Pavement Co., 25 Broad St., New York City. (No. 393, Vol. 7, pp. 567, 750.)

1984—Chicago, Ill.—The Oelerich & Berry Co. will soon be in the market for approximately 20 cars of Illinois washed nut coal. Address Pur. Agt. Oelerich, Oelerich & Berry Co., 864 Larrabee St., Chicago, Ill.

1985—Philadelphia, Penn.—The Powers-Weightman-Rosengarten Co. will soon contract for its annual supply of pea coal, amounting to 800 tons. Deliveries are to be made at East Falls, Philadelphia. Address Purchasing Agent, Powers-Weighman-Rosengarten Co., Ninth and Parrish St., Philadelphia, Penn.

1986—Toledo, Ohio—The George M. Jones Co. is in the market for prompt shipment of 2,500 tons of West Virginia mine-run nut and slack coal. Address Pur. Agt. A. E. Wittwer, the George M. Jones Co., Toledo, Ohio.

1987—Harlan, Iowa—The City Council will receive bids until Feb. 14 for furnishing the Municipal Electric Light plant with approximately 2,800 tons of coal. Deliveries are made at the rate of about five carloads per month and the present contract, which expires on Feb. 14, is being filled on Colfax (Iowa) steam coal. Address Supt. C. D. Lutton, Municipal Electric Light Plant, Harlan, Iowa. (No. 49, Vol. 7, pp. 149, 358.)

+1988—Yonkers, N. Y.—The Board of Contract and Supply received bids until 3:30 p.m., Jan. 17, for furnishing and delivering 250 gross tons of stove coal and 60 tons of nut to the Public Bath houses. All bids must be accompanied by certified check for 5% of the amount bid. Address Secy. Edward P. Walsh, Bd. of Contract and Supply, City Hall, Yonkers, N. Y.

+1989—Philadelphia, Penn.—The City Government received bids until noon, Jan. 20, for furnishing and delivering a reserve supply of storage coal for use at the Shawmont Pumping Station and the Torresdale Filter Plant. Deliveries are to be made during January, February and March. Address Dir. Joseph S. McLaughlin, Dept. of Sup., City Hall, Philadelphia, Penn. (No. 1835, Vol. 8, p. 1089; Vol. 9, pp. 36, 106, 148.)

1990—Chicago, Ill.—The S. Obermayer Co. will soon be in the market for its annual fuel supply, amounting to about 30 tons per day of Illinois and Pennsylvania washed nut and slack coal. Address Pur. Agt. Peterson, S. Obermayer Co., 2563 West 18th St., Chicago, Ill.

1991—Cleveland, Ohio—The Goff-Kirby Coal Co. is in the market for a prompt shipment of 5,000 tons of West Virginia nut and slack coal. Address Vice-Pres. J. L. Deegan, Goff-Kirby Coal Co., Cleveland, Ohio.

1992—Chester, Penn.—The Penn Steel Casting and Machine Co. usually contracts for its annual fuel supply, involving approximately 4,000 tons of broken coal, at about this time. Address General Manager, Penn Steel Casting and Machine Co., Chester, Penn.

1993—Buffalo, N. Y.—The Monongahela-Youghiogheny Coal Co. is receiving quotations on a tonnage of West Virginia splint lump and slack. Bidders should state when they can ship. Address Mgr. John Q. Clarke, the Monongahela-Youghiogheny Coal Co., Buffalo, N. Y.

1994—Chicago, Ill.—The Edgar Allen American Manganese Steel Co. will be in the market about Feb. 15 for its annual fuel supply, involving approximately 2,000 tons of Illinois mine-run coal. Address Pur. Agt. Peebles, Edgar Allen American Manganese Steel Co., 332 South Michigan Ave., Chicago, Ill.

1995—Detroit, Mich.—The Detroit & Pittsburg Coal Co. is receiving quotations on 1,000 tons of West Virginia mine-run and on the same tonnage of splint 1½-in. lump coal. Address Gen. Mgr. George C. Hubner, the Detroit & Pittsburg Coal Co., Detroit, Mich.

+1996—Homestead, Penn.—The Town Government will receive bids until noon, Jan. 22, for furnishing the garbage plant with between 18,000 and 20,000 bu. of coal. Bids should include cost of delivery at the plant. Address Clk. A. I. Ritchie, Homestead, Penn.

1997—Chicago, Ill.—The Northwestern Yeast Co. is now purchasing its requirements, involving about 10 cars of Indiana fifth vein, 1¼-in. bar screenings, in the open market. Address Pur. Agt. T. P. Hodge, Northwestern Yeast Co., 1750 North Ashland Ave., Chicago, Ill. (No. 419, Vol. 7, p. 568.)

1998—Philadelphia, Penn.—Swayne & Co. are requesting tenders on 500 tons of West Virginia mine-run coal for immediate shipment. Address Purchasing Agent Swayne & Co., Philadelphia, Penn.

1999—Wildwood, N. J.—The Wildwood Water-Works Co. is in the market for its annual supply of anthracite pea

coal amounting to about 400 tons. The coal is for use in a producer-gas generator. Address Purchasing Agent, Wildwood Water Works Co., Wildwood, N. J.

2000—Vandalia, Ill.—The Ford Manufacturing Co. is receiving tenders on 1,000 tons of either 1½-in. screenings, No. 2 nut, 2-in. lump, 6x2-in. egg, or mine-run, for shipment at the rate of three cars per week. Deliveries are to begin immediately. Address Gen. Mgr., L. M. Ford, The Ford Manufacturing Co., Vandalia, Ill.

2001—Chicago, Ill.—The Windemere Co. will contract about Mar. 1 for its annual fuel requirements involving approximately 4,000 tons of Franklin County screenings. Address Purchasing Agent, The Windemere Co., Chicago, Ill.

2002—Chicago, Ill.—The American Maize Products Co. will contract some time early in the spring for its annual fuel requirements, involving about 250 tons of Franklin County, Illinois, coal per day. The contract is to run for one year. Address Pur. Agt. Bensing, American Maize Products Co., 111 West Monroe St., Chicago, Ill.

2003—Columbus, Ohio.—The Lorain Coal and Dock Co. is receiving quotations for a prompt shipment of 500 tons of West Virginia nut and slack coal. Address Vice-Pres. F. W. Braggins, Lorain Coal and Dock Co., Columbus, Ohio.

2004—Kansas City, Mo.—The Hunt Laundry Co. is changing from fuel oil to coal, and will be in the market for about 60 tons per month, for which they are now considering contracting. Address Pres. O. L. Shane, Hunt Laundry Co., 812 Brooklyn Ave., Kansas City, Mo.

2005—Pittsburgh, Penn.—The Moreland Coke Co. is receiving quotations on 2,500 tons of West Virginia screenings, and about 10 cars of splint lump coal. Bidders should quote freight rates to Cleveland, Detroit and Akron. Address The Moreland Coke Co., Pittsburgh, Penn.

2006—Chicago, Ill.—The National Lead Co. will be in the market about Mar. 15 for approximately 130 tons of Indiana nut per week and on June 15 for about 200 tons per month of Pocahontas mine-run. The contract is to run for one year. Address Pur. Agt. Rockwell, National Lead Co., 900 W. 18th St., Chicago, Ill.

2007—Cleveland, Ohio—The Wadsworth Salt Co. is in the market for approximately 3,500 tons of Pittsburgh No. 8 mine-run coal, deliveries to be completed by Apr. 1. Shipments are to be in hopper bottom equipment, and delivery by Erie Ry. Address Pur. Agt. A. E. Yoder, Wadsworth Salt Co., Wadsworth, Ohio.

2008—Chicago, Ill.—The Dunham Towing and Wrecking Co. is in the market for its annual fuel supply, involving between 5,000 and 6,000 tons of Youghiogheny coal. Address Pur. Agt. Young, Dunham Towing and Wrecking Co., 305 N. 5th Ave., Chicago, Ill.

2009—Cadiz, Ohio—Bids will be received until 9 a.m., Feb. 7, for furnishing coal as may be required for the Children's Home during the ensuing year. Bidders should quote on lump, mine-run and slack per bushel. Address Supt. E. E. Webb, Harrison County Children's Home, Cadiz, Ohio.

2010—Jersey City, N. J.—The Board of Chosen Freeholders will receive bids until 3 p.m., Jan. 27, for furnishing coal for the County Court House and jail, during the fiscal year ending Nov. 30. All bids must be accompanied by a certified check for 10% of the amount bid. Address Clk. Walter O'Mara, County Court House, Jersey City, N. J.

2011—Chicago, Ill.—The Livingston Baking Co. will contract for its annual requirements of Solvay coke, involving about 100 tons per month some time early in the spring. Address Pur. Agt. Heigenrecher, Livingston Baking Co., 4126 S. Wabash Ave., Chicago, Ill.

2012—Detroit, Mich.—The Southland Coal Co. is in the market for approximately 200 tons of 4-in. mine-run coal per day deliveries to be made during April, May and June. Address Secy. L. G. Mosher, Southland Coal Co., Detroit, Mich.

2013—Tarentum, Penn.—The Borough Council received bids until 5 p.m., Jan. 20, for furnishing coal as may be required at the Electric Plant during the ensuing year. Bids were requested on both screened lump and mine-run and the successful bidder will be required to furnish a bond for $5,000. Address Secy. W. S. Robinson, Borough Office, Tarentum, Penn.

2014—Chicago, Ill.—The Hamler Boiler and Tank Co. is now purchasing in the open market and is open for a proposition to contract for its annual requirements involving between 2,500 and 3,000 tons of Franklin County, Ill., No. 2 nut coal. Address Purchasing Agent, Hamler Boiler and Tank Co., 3906 S. Halsted St., Chicago, Ill.

2015—St. Louis, Mo.—The Polar Wave, Ice and Fuel Co. is receiving bids for a short term contract involving two cars per day of Standard or intermediate grade, 1½-in. or 2-in. screenings for delivery to the Newstead Ave. plant. The contract is to run until Apr. 1, and the coal must be furnished in self-clearing drop-bottom cars. Address Pur. Agt. John Steuber, The Polar Wave, Ice and Fuel Co., Grand and Olive St., St. Louis, Mo. (No. 1949, p. 150.)

2016—Baltimore, Md.—G. W. Hendley & Co. are in the market for approximately 5,000 tons of gas coal for shipment during the next 30 days to Newport News, Va. Address G. W. Hendley & Co., Baltimore, Md.

Contracts Awarded

Note—Successful bidders are noted in **bold face** type.

+1543—Frankfort, Ky.—This contract (Vol. 8, p. 617), which provides for furnishing the Franklin County Jail, Residence, Court House and Poor Farm with coal, has been awarded to **Mary M. Brawner** at 10½c. per bu. for lump and 9½c. for nut. Address Clk. Crawford Lee, Franklin County Fiscal Court, Frankfort, Ky.

1643—Birmingham, Ala.—This contract (Vol. 8, pp. 870, 998), which provides for furnishing the Birmingham Railway, Light and Power Co. with approximately 25,000 tons of coal has been awarded to the **Pratt Consolidated Coal Co.** on washed slack coal. Address Pur. Agt. Charles P. Doerr, Birmingham Railway, Light and Power Co., Birmingham, Ala.

+1651—Norfolk, Va.—This contract (Vol. 8, p. 871, Vol. 9, p. 106), which provides for furnishing the United States Engineer's Dept. with approximately 3,000 tons of bituminous coal, has been awarded to **Castner, Curran & Bullitt, Inc.,** at $2.39 per ton. Address Lt.-Col. J. R. Jerry, Corps of Engineers, Custom House, Norfolk, Va. (No. 550, Vol. 7, pp. 709, 1004).

1773—Cheltenham, Penn.—This contract (Vol. 8, p. 1044), which provides for furnishing the fuel requirements of the Ames Shovel and Tool Co. for the year beginning Jan. 1, involving approximately 1,500 tons, has been awarded for the first quarter of the current year to the **Philadelphia & Reading Coal and Iron Co.** Address Purchasing Agent, Ames Shovel and Tool Co., Cheltenham, Penn.

1779—Philadelphia, Penn.—This contract (Vol. 8, p. 1044), which provides for covering the fuel requirements of Horrocks & Brother, involving about 3,500 tons of buckwheat coal per annum, has been awarded for the first three months of this year to the **Philadelphia & Reading Coal and Iron Co.** Address Purchasing Agent, Horrocks & Brother, Frankford, Philadelphia, Penn.

1781—Philadelphia, Penn.—This contract (Vol. 8, p. 1,044), which provides for furnishing the Arnholt & Schaefer Brewing Co. with its fuel supply, involving about 2,000 tons of buckwheat and rice coal per annum, has been awarded to the **Philadelphia & Reading Coal and Iron Co.** for the period ending Apr. 1. Address Purchasing Agent, Arnholt & Schaefer Brewing Co., 31st and Thompson St., Philadelhia, Penn.

Contract Notes

East St. Louis, Ill.—The contract for furnishing the Kehlor Flour Mills with approximately 400 tons of washed nut coal per month has been awarded to the **Peabody Coal Co.**

St. Louis, Mo.—The Robinson Coal Co. has contracted with the **Consolidated Coal Co.** for its requirements of Mt. Olive lump coal, and with the **Chicago, Wilmington & Franklin Coal Co.** for a tonnage of "Old Ben" coal.

Decatur, Ind.—Krick Tyndall & Co., at this place consume approximately 250 tons of coal per week. The company has storage capacity for 500 tons. Address Pur. Agt. Geo. M. Kreek, Krick, Lyndall & Co., Elm St., Decatur, Ind.

East St. Louis, Ill.—The contract for furnishing the Pure Carbonic Co. with approximately 500 tons per month of Nos. 2 or 3 washed nut coal, has been awarded to the **Consolidated Coal Co.** Address Pur. Agt. and Gen. Mgr. Taylor, Pure Carbonic Co., East St. Louis, Ill.

Louisville, Ky.—The Weissinger Gaulbert R. E. Co., consumes about 700 tons of Western Kentucky pea and slack coal per annum, deliveries being made by wagon at the rate of approximately 150 tons per week. Address Mgr. H. Wiegman, Weissinger Gaulbert R. E. Co., 3rd and Broadway, Louisville, Ky.

Cleveland, Ohio—The Cuyahoga Brick Shale Co. consume approximately 500 tons of ¾- or 1¼-in. Pocahontas lump per annum, which is bought in the open market. Deliveries are made by railroad at the rate of one car per month, and the company has a storage capacity of 100 tons. Address Pur. Agt. R. J. Dawson, R. F. D. No. 1, Brooklyn Station, Cleveland, Ohio.